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Suicide in Asia and the Pacific

Edited by
Harry Minas and Erminia Colucci

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Guest Editors

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About the Editors

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Preface

Suicide is a public health and global mental health priority. Over 700,000 lives are lost annually, and each year a great many more people engage in suicidal behaviours or are directly impacted by suicide. As the second leading cause of death among young people aged 15–29 years, and with almost 80% of suicides occurring in low- and middle-income countries, improving our understanding of suicide in Asia and the Pacific is vitally important.

The papers in this Reprint were published in a Special Issue that sought to capture the diversity of experiences, beliefs, and suicide prevention approaches across one of the world's most culturally diverse regions. They demonstrate that suicide cannot be understood through universal frameworks alone and highlight how cultural beliefs, social structures, historical contexts, social justice, gender equality, economic opportunity, and historical trauma shape the expression of suicidal behaviour and point to pathways for prevention. Together, they argue for culturally grounded approaches that value local knowledge while addressing the systemic inequities that contribute to suicide risk, and demonstrate that deep cultural understanding and community engagement are essential for the development of evidence-based interventions and effective suicide prevention.

The gendered dimensions of suicide emerge powerfully in two papers. *Marecek and Senadheera* analyse young women's suicidal acts in Sri Lanka, revealing them as responses to family conflicts and compromised sexual respectability within patriarchal constraints. *Canetto, Menger-Ogle, and Subba*, in their innovative study of suicide scripts in Nepal, show how female suicide is understood as a response to systematic oppression, while male suicide is viewed through both societal and psychological lenses. These studies emphasize that prevention must address structural inequalities, including those that are gender-related, not just individual risk factors.

Kumar and colleagues identify the crisis within India's police forces through their qualitative study in Rajasthan. Officers describe feeling like "puppets" within rigid hierarchical structures inherited from colonial systems. Their findings reveal that organizational factors—bureaucracy, a lack of resources, limited leave—contribute more to distress than operational stressors, calling for institutional reform alongside individual support.

From Japan, *Fujieda et al.* identify practical screening indicators for primary care settings, finding that fatigue on waking, insomnia, and workplace relationship problems predict suicidal ideation among middle-aged patients. *Ono and colleagues* document the sobering reality that severely injured patients presenting to a hospital emergency department following a suicide attempt have a higher mortality and longer hospital stays than patients matched for similar injury severity but no suicide attempt, highlighting the need for greater attention to, and specialized protocols for, patients with trauma caused by a suicide attempt.

Understanding barriers to help-seeking proves helpful for prevention. *Mason et al.* reveal that New Zealand university students often view their distress as "not serious enough" for professional help, and that simple infographics about access to available services can shift these perceptions. From Hawai'i, *Dudla and colleagues* demonstrate how incorporating Native Hawaiian values like "pilina" (connection-building) into prevention strategies creates more culturally resonant and effective approaches.

This collection makes several contributions to our understanding of suicide and suicide prevention in Asia and the Pacific. First, it demonstrates the limitations of implementing Western-centric models of suicide and suicide prevention in different socio-cultural contexts and the urgent need for locally developed theories and interventions. Second, it highlights the importance of attention to issues of

social justice, gender equality, economic opportunity, and historical trauma in understanding and preventing suicide. Third, it provides some practical insights for developing culturally responsive prevention strategies that value local knowledge in the development of evidence-based approaches. Finally, it further illustrates the importance of using a diversity of research methods to enrich our understanding of, and develop interventions for, this complex phenomenon

As we work toward the Sustainable Development Goal of reducing suicide rates, these papers remind us that prevention must be rooted in cultural understanding, community engagement, and systemic and structural change. The papers in the collection highlight the need for approaches that address individual risk factors and the social structures, cultural norms, and historical legacies that shape suicidal behaviour, and that suicide prevention strategies and programs must be culturally grounded, emerging from within communities rather than imposed from without. In doing so, they suggest that the future for suicide prevention across Asia and the Pacific should encompass both the universality of human suffering and the specificity of the cultural contexts in which that suffering is experienced and addressed.

Harry Minas and Erminia Colucci
Guest Editors

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Article

A Mixed-Methods Evaluation to Inform the Hawai'i Suicide Prevention Strategic Plan

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Abstract: The Prevent Suicide Hawai'i Taskforce is a state, public, and private partnership of individuals, organizations, and community groups that leads statewide suicide prevention efforts in Hawai'i. The purpose of this evaluation was to identify the progress and barriers of the Taskforce to inform the upcoming 2025 Hawai'i Suicide Prevention Strategic Plan in the following areas: Hope, Help, Heal, Research and Evaluation, and Policy and Advocacy. Utilizing a sequential exploratory mixed-methods approach, 18 key informants were interviewed, followed by a 13-question survey sent to the Taskforce member listserv. Results were analyzed using qualitative coding techniques and descriptive statistics. Interview findings contained six themes: importance of community relationships, interconnection of suicide prevention efforts, progress in diversifying training, organizational challenges, adaptations to the COVID-19 pandemic, and funding challenges. Of the 34 survey respondents, most were involved in the area of Hope (91%). The respondents reported the area with most progress was Hope (87%), and the most important area to address was Help (41%). The majority (82%) of the respondents characterized the level of Taskforce communication as Excellent or Good. Interview and survey data corroborated each other and revealed new insights about the successes and barriers of the Taskforce and their progress in implementing the Strategic Plan. Recommendations included advocating for long-term funding for suicide prevention and building community relationships.

Keywords: suicide; suicide prevention; program evaluation; community action; suicide policy; suicide strategy; organizational objectives; Hawai'i; mixed methods; suicide prevention training

1. Introduction

1.1. Suicide in the United States

Suicide is a serious public health issue. In 2020, there were 45,979 deaths by suicide, 1.2 million suicide attempts, and an age-adjusted suicide rate of 13.48 per 100,000 individuals, making it the 12th leading cause of death in the United States [1]. The risk of suicide can be influenced by a combination of factors, ranging from individual and relationship factors, such as a history of depression and bullying, to community and societal factors, such as historical trauma, discrimination, and stigma associated with mental illness [2].

1.2. Suicide in Hawai'i

Studies have shown that in Hawai'i, a high level of family cohesion, positive friendships, and belonging to a community that enhances connection and care are protective factors against suicide [3,4]. Nevertheless, suicide remains a leading cause of death in Hawai'i, with an age-adjusted rate of 12.9 deaths per 100,000 in 2021 [5,6]. Similar to other health issues, there are disparities in suicide trends among certain subgroups in Hawai'i.

Health disparities, in general, are rooted in structural inequities that negatively impact specific groups of people [7]; this is especially salient to recognize in Indigenous communities who experience collective trauma, discrimination, and land loss from colonization [8]. Between 2017 and 2021, Native Hawaiians and Other Pacific Islanders had a higher age-adjusted suicide death rate (17.1 and 20.6) compared to the overall population in Hawai'i (13.1) [9]. Similar to national patterns, individuals living in rural counties in the state of Hawai'i also have a higher risk of suicide compared to those that live in urban areas, with the highest age-adjusted rates in Hawai'i County (20.9), followed by Maui County (17.6), Kaua'i County (13.0), and Honolulu County (11.1), between 2019 and 2021 [10]. Overall, youth in Hawai'i are also at a higher risk, with suicide being the second leading cause of death among youth of ages 15–24 and 25–34 years and the fourth leading cause among ages 1–14, 35–11, and 45–54 years [11].

1.3. Prevent Suicide Hawai'i Taskforce

In 2001, the Prevent Suicide Hawai'i Taskforce (Taskforce) was established as a partnership of individuals, community groups, and organizations who work together to bring attention to suicide prevention in Hawai'i [12]. The Taskforce now includes a diverse group of members from over 100 different public and private organizations across Hawai'i [13]. The Taskforce encompasses the social and cultural contexts in Hawai'i to develop policy, legislation, and strategic planning for suicide prevention. Within the statewide Taskforce, there are four county-specific Taskforces on O'ahu, Kaua'i, Hawai'i Island, and Maui County, which includes the islands of Maui, Moloka'i, and Lāna'i.

1.4. The State's Strategic Plan

In 2017, the Taskforce developed the State of Hawai'i's Strategic Plan on Suicide Prevention (referred to as Strategic Plan), intending to reduce suicide in Hawai'i by at least 25% by 2025 [13]. This document was submitted to the Hawai'i State Legislature on December 28, 2017. The five areas of the Strategic Plan are Hope, Help, Heal, Research and Evaluation (Research), and Policy and Advocacy (Policy) (see Table 1). Hope focuses on prevention by increasing community awareness around suicide prevention and improving statewide capacity for training. For example, Hawai'i's Caring Communities Initiative for Youth Suicide Prevention works to raise suicide awareness and promote protective factors through workshops on hula, lei-making, and other culturally relevant activities [3]. The second strategy, Help, ensures that suicide prevention is a core component of Hawai'i's overall system of care. The University of Hawai'i, John A. Burns School of Medicine, Department of Psychiatry (JABSOM-DOP) is a leader in providing suicide prevention training, such as the Connect Suicide Prevention Program and SafeTalk to healthcare providers and the community [3]. JABSOM-DOP has also adopted the Zero Suicide Conceptual Approach and Practice framework to its healthcare system to improve outcomes for those at risk for suicide. Services provided include suicide screening, assessment, and treatment [3]. The third strategy, Heal, aims to increase community capacity to effectively and efficiently respond to individuals and communities affected by suicide. Research is the fourth strategy that informs suicide prevention programs, interventions, policies, and overall Statewide direction. The last strategy, Policy, ensures that policies and protocols set the proper foundation for suicide prevention initiatives.

Current trends show suicide rates in Hawai'i have varied each year, though not significantly, since the inception of the Strategic Plan, from 14.5 deaths per 100,000 (95% CI 12.6, 16.4) in 2017 to 11.3 (95% CI 9.6, 13.0) in 2018, 15.0 (95% CI 12.9–17.0) in 2019, 11.8 (95% CI 10.0, 13.6) in 2020, and 12.9 (95% CI 11.0, 14.8) in 2021 [5,6]. Additionally, although the Taskforce has been heavily involved and active in suicide prevention efforts, there has yet to be an evaluation of its progress and priorities as they relate to the Strategic Plan. Therefore, an evaluation was conducted to ensure that the Taskforce continues to make maximum impact on suicide prevention in Hawai'i, according to the members' input. This evaluation prioritized data collection of member experiences and knowledge

regarding the Taskforce because engaging stakeholders throughout evaluation processes increases the relevancy of findings and ensures that recommendations are more likely to be adopted by the organization [14]. The results from this evaluation will inform the second iteration of the Strategic Plan in 2025.

Table 1. Strategic plan areas.

Strategy	Goal(s)
Strategy 1: Hope	1a. Increase community awareness and communication around suicide prevention as a public health problem that is preventable. 1b. Increase statewide capacity for training across multiple levels and disciplines, including a focus on cultural humility with diverse populations.
Strategy 2: Help	2. Promote suicide prevention as a core component of Hawai'i's overall system of care.
Strategy 3: Heal	3a. Increase Hope, Help, Healing, and Wellbeing among those personally touched by suicide and among those with lived experience. 3b. Increase State and Community capacity to effectively and efficiently respond to individuals and communities affected by suicide and those with mental health challenges.
Strategy 4: Research and Evaluation	4. Conduct and support high- quality research and evaluation to inform suicide prevention programs, interventions, policies, and overall Statewide direction.
Strategy 5: Policy and Advocacy	5. Ensure policies and protocols set the proper foundation for suicide prevention initiatives.

1.5. Theoretical Framework

Since the Taskforce operates around the five strategies of the Strategic Plan, the evaluation utilized them as the overarching framework. An exploratory sequential, mixed-methods approach through interviews with select Taskforce stakeholders, followed by a survey with the larger Taskforce was deemed appropriate for this evaluation. The qualitative approach for the first phase of the evaluation (interviews) identified salient themes with regard to the five Strategic Plan areas. These themes were then incorporated into the survey to gauge generalizability among the larger Taskforce members [15]. The qualitative and quantitative data results were then integrated to provide a richer understanding of the results [15].

1.6. Project Purpose and Plan

This evaluation aimed to inform the Strategic Plan's upcoming review by conducting individual and small group interviews with key Taskforce members and a survey with the entire Taskforce. The evaluation aimed to answer three evaluation questions:

- What successes and barriers has the Taskforce faced?
- What is the level of involvement, progress, and future priorities for the Taskforce in each area of the Strategic Plan (Hope, Help, Heal, Research, and Policy)?
- What is the level of collaboration and communication in the Taskforce?

2. Materials and Methods

2.1. Study Design

This evaluation employed a sequential exploratory mixed-methods approach [15]. A mixed-methods approach involves the separate collection and analysis of qualitative and quantitative data [15]. This is followed by the integration of the two datasets to gain a more comprehensive understanding of the problem, typically represented graphically by a joint

display [15]. Specifically, a sequential exploratory design begins with the collection of qualitative data (Phase 1) to explore a phenomenon when the problems are not well understood; an instrument (a survey) is then developed based on those findings (Intermediate Step) and then implemented on a larger sample (Phase 2) [15]. This evaluation contained three phases: Phase 1 involved individual and small group interviews to identify salient themes that informed the development of a survey (Intermediate Step) implemented among the entire Taskforce in Phase 2 (see Figure 1).

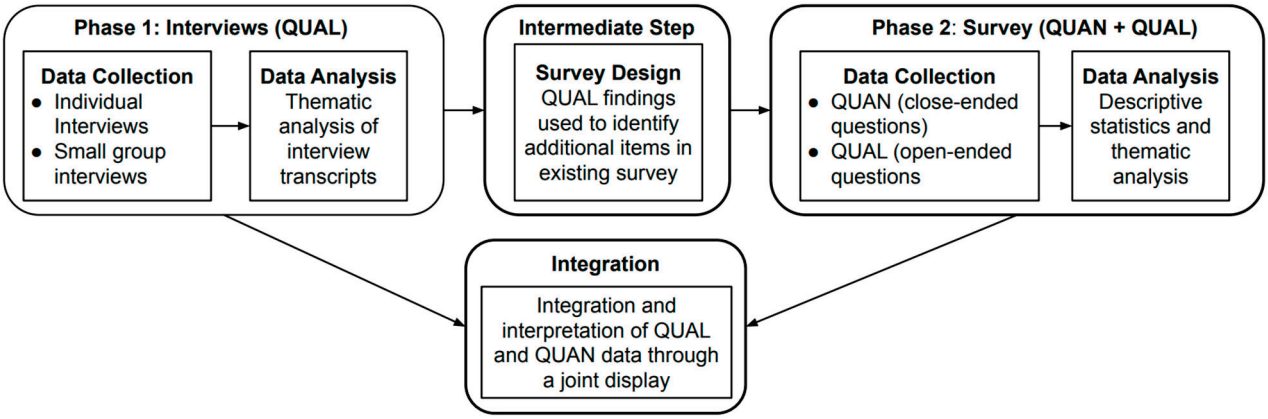

Figure 1. Study design.

2.2. Participants

2.2.1. Phase 1 (Individual and Small Group Interviews)

Taskforce members and/or stakeholders involved in suicide prevention in Hawai'i were eligible for this phase of the evaluation. A purposive sampling technique was used, where Taskforce steering committee members recommended potential participants to be interviewed individually or in a small group, depending on the nature of their role. Steering committee members hold key positions on the County Taskforces, within State agencies, or are key partners in implementing the Strategic Plan. They identified 19 individuals who were considered knowledgeable about suicide prevention activities in the State or a County of Hawai'i. Participants who are involved in the same initiatives/workgroups were interviewed in small groups. This helped ensure insights were grounded in a common context and reduced the number of required interviews and redundancy between interviews.

2.2.2. Phase 2 (Survey)

All Taskforce members and/or stakeholders involved in suicide prevention in Hawai'i were eligible for this phase. Members have signed up to receive monthly correspondence about suicide prevention activities. Some members also participate in training and networking opportunities offered every other month at Taskforce meetings.

2.3. Measures

2.3.1. Phase 1 (Individual and Small Group Interviews)

The evaluation team collaboratively wrote a semi-structured interview script that aimed to elicit information of the current state and direction of the suicide prevention movement in Hawai'i, the progress being made with respect to each area of the Strategic Plan, and what contributes to or prevents progress. The interview script contained opening, transition, key, and summary questions, for a total of 17 questions [16].

2.3.2. Intermediate Step (Survey Development)

The survey consisted of 13 Likert-scale, six multiple-choice, and four open-ended questions (Supplementary Figure S1). The main findings from Phase 1 (interviews) prompted further investigation into Taskforce members' perceptions about the progress being made

in the various areas of the Strategic Plan, which areas deserve priority, and the level of involvement, collaboration, and communication in the Taskforce. The six questions regarding the assessment of progress, priority, and involvement were drawn from the Taskforce's 2017 Strategic Planning Member Survey, an instrument that has not been psychometrically tested, yet was developed collaboratively by leaders of the Taskforce following the Strategic Plan to ensure content validity. The two questions about communication and collaboration were taken from the 2022 State and Territorial Suicide Prevention Evaluation Survey [17] and the Levels of Collaboration Scale [18]; the former is a nationally utilized survey conducted annually since 2021 [17], and the latter is a collaboration scale that has been tested for reliability and validity [18]. The remaining five questions asked for demographic information and an open-ended inquiry for final comments.

2.4. Procedures and Analysis

2.4.1. Phase 1 (Individual and Small Group Interviews)

Each potential participant received an email that contained the purpose and process of the evaluation, the consent process, and potential meeting dates. The evaluation team scheduled 30–90 min individual and small group interviews, then emailed a Summary of the Strategic Plan (Supplementary Table S1) and a Zoom meeting link.

Each interview began with personal introductions, the cultural practice of "talking story", and an icebreaker. The interviewers then reiterated the purpose and process of the study. During the informed consent process, individuals were asked for verbal consent for permission to (1) audio record the interview or small group and (2) attach their name to their responses in the results. If the individual did not consent to either, the research team took notes and omitted any identifying information from their data. Following the consent process, the team conducted the individual or small group interviews with the interview script. Each interview was 60 min on average. Each participant received a note and gift card as a thank-you for their involvement.

Audio recordings were transcribed verbatim by the evaluation team. After the transcriptions or notes were sent to participants for approval, the recordings were deleted. Interviews were individually coded using an inductive coding technique for ideas related to the Taskforce's progress and barriers, and each code was compiled into a spreadsheet. Reliability was ensured through investigator triangulation of multiple collaborative discussions, where each code was reviewed and grouped into themes. Overall, six themes were identified. Validity of the themes was ensured when the investigators sought feedback from the Taskforce in their dissemination efforts. These findings were utilized to make recommendations for the Taskforce.

2.4.2. Phase 2 (Survey)

Emails were sent to Taskforce leaders who served on the steering committee on 10 October 2022. The recipients were asked to forward this email with the Google Forms survey link to their respective members on the Taskforce listserv, which included 239 individuals. The first page of the Google Forms survey contained the consent form, and participants provided their consent by proceeding to the next page. Three reminder emails were sent on 24 October, 31 October, and 7 November 2022. The survey was closed on 15 February 2023.

The survey results were compiled into a spreadsheet. Descriptive statistics such as frequency and percentages were used to summarize Likert-scale responses. Open-ended questions were coded individually and then compiled into themes as a group.

2.4.3. Integration of Phase 1 and 2 Databases

Phase 1 (interviews) and Phase 2 (survey) databases were integrated systematically to confirm and elaborate on findings; this process was visualized in a joint display table. For each evaluation question, qualitative results from interviews were listed in the first column of the table, and matching quantitative and qualitative results from the survey were listed adjacent in the third and fourth columns. The evaluation team independently

determined whether the data in these three columns confirmed, elaborated on, or refuted each other and collaboratively produced the fourth column, the final interpretation of the combined data.

3. Results

3.1. Phase 1 (Individual and Small Group Interviews)

A total of 18 individuals participated in five individual and five small group (three groups of two and three groups of three) interviews from 21 October 2021 to 19 November 2021. Collectively, participants spent an average of 11 years involved with the Taskforce. We identified six themes from the interviews (Table 2).

Table 2. Interview themes.

	Interview Themes
1.	Suicide prevention efforts are centered on building and sustaining relationships and partnerships with the community to achieve goals.
2.	The Taskforce views suicide prevention in a holistic, interconnected, and cyclical way.
3.	There has been much progress in the number and types of suicide prevention trainings for diverse populations.
4.	The Taskforce faces challenges with organization in statewide suicide prevention efforts.
5.	COVID-19 has presented challenges to Hawai'i's communities and the Taskforce. However, the Taskforce has responded with strength, creativity, and adaptability to continue its suicide prevention efforts.
6.	The Taskforce faces challenges with long-term and sustainable funding.

3.1.1. Theme 1: Suicide Prevention Efforts Are Centered on Building and Sustaining Relationships and Partnerships with the Community to Achieve Goals

Suicide prevention is an ongoing, community-centered process that is focused on building and sustaining relationships. Most interviews mentioned that the Taskforce valued diversity and acknowledged that every member has their own strength and specialty that contribute to the overarching mission of suicide prevention. One participant stated the following:

> *"I think we all come out as a collective impact. We do not do things individually. It's strict collaboration. . . and that's what the Taskforce is all about... We work collaboratively, we work as partners collectively, and we support each other."*

Furthermore, most interviews mentioned that building and sustaining relationships is fundamental to achieving organizational objectives and overcoming challenges, such as sharing resources to counter the lack of funding. One participant stated,

> *"In general, successful policy and advocacy can be achieved by building bridges and fostering kind and helpful relationships. It is easy to react to an event, but it's much harder to grow roots. The role of us is to foster, grow, and identify new partnerships."*

3.1.2. Theme 2: The Taskforce Views Suicide Prevention in a Holistic, Interconnected, and Cyclical Way

Many interviews mentioned that approaches to suicide prevention should take a holistic perspective. From the health service context, participants stated the importance of continuity of care and the inextricable link between physical and mental health. One participant stated,

> *"...make sure that those providers are talking to each other, they're not working in silos. And so if the primary care doctor knows that they're seeing someone for mental health and the mental health person can call to make sure that, you know, all these different things they're seeing are also being addressed so they can just have those beautiful discussions."*

Participants also spoke about how each of the Strategic Plan's five strategies should not be viewed or tackled in isolation because they feed into and impact one another. One participant stated,

> *"That's what strategy three (Heal) was meant to be, that after a suicide occurs in postvention, to really build up our ability to not just have these steps of progress, but to respond because we say good postvention (Heal) is actually good prevention (Hope). Because when you do a good response, then it actually helps to reduce risk for the people in that family or in that community."*

3.1.3. Theme 3: There Has Been Much Progress in the Number and Types of Suicide Prevention Training for Diverse Populations

There was high consensus among the participants that suicide prevention training in Hawai'i has progressed in both quantity and types of training offered. These include SafeTALK, ASIST, and Youth Mental Health First Aid training. These training courses educate about suicidal risk and protective factors, teach resiliency and coping skills, and connect the community to resources.

The Taskforce has partnered with numerous organizations such as the Hawai'i Department of Education and police departments to train their employees, including teachers, counselors, administrators, and police officers. In the wider community, the participants spoke about how the Taskforce strives to ensure that all training and outreach programs are culturally relevant to the diverse population of Hawai'i. One participant stated,

> *"Really approaching cultural diversity is such a huge thing. I mean, we're in Hawai'i, we're such a diverse cultural state. We should all be respectful of everyone's culture."*

Despite the progress, the participants reported that there is still room for improvement to ensure that training efforts strike a balance between being culturally aligned and evidence-based:

> *"We are constantly getting feedback from our evidence-based trainings, that they are not aligned with the culture here."*

And,

> *"How do we approach, you know, what is culturally relevant for them? You know, everything from eye contact or lack of eye contact, body, language, face-to-face side, you know, all those kinds of things we need to take into consideration."*

3.1.4. Theme 4: The Taskforce Faces Challenges with Organization in Statewide Suicide Prevention Effort

Though Taskforce diversity is a source of strength in achieving collective impact, many interviews also noted the lack of a unifying framework for maintaining organization of the Taskforce's activities, including events to raise awareness about suicide prevention and safe messaging, suicide prevention trainings, and maintaining the Hawai'i Coordinated Access Resource Entry System (Hawai'i CARES).

One participant stated,

> *"I love the group that's attracted to this. But we also could get a little more organized if we're going to join together and really take it to the next level because so much has already happened. So we've got a foundation, now we've got to really get it together for what's next."*

Multiple interviews mentioned that the Taskforce needs a more organized postvention system to ensure that coordinated services are continuously available to the community. One participant stated,

> *"It can't just be that handful of people. . .that is able to provide that support and provide that [postvention] response. So then from a system stand point, how do we build that better? So that we have providers in the state that are capable of doing such a thing, but how do we connect that all?"*

3.1.5. Theme 5: COVID-19 Has Presented Challenges to Hawai'i's Communities and the Taskforce—However, the Taskforce Has Responded with Strength, Creativity, and Adaptability to Continue Its Suicide Prevention Efforts

The COVID-19 pandemic presented challenges to the suicide prevention movement and Taskforce. The pandemic decreased the social connectedness of the Taskforce and community members, as they could no longer hold training, meetings, and suicide survivor events in person. Another challenge for the community was the increase in mental health issues, including depression and anxiety.

One participant stated,

> *"We're at a higher risk this year than we have been in the past. And I really have to attribute that to the isolation and COVID. I think that COVID has really affected a lot of people. We have more suicides right now to date than we did last year for the whole year. We still have more than a month-and-a-half to go. And it's such an at-risk time, even with the ebbs and the flows of what we're seeing in our community."*

However, COVID-19 also highlighted the community's strengths, creativity, and ability to adapt to uncertain situations presented by the pandemic. One participant stated,

> *"But yet we continued those conversations about what everyone was doing and adapting, which was very helpful . . . so at that point, I think it was a lot of brainstorming and supporting one another. And we're very thankful to have had that . . . and even when the resources seemed to get smaller and tighter, we still would say, 'How can we partner in really creative ways? Who have I not worked with? How can we use what we have to make the most out of it?' And out of this, again, an unexpected silver lining was really creative partnerships."*

3.1.6. Theme 6: The Taskforce Faces Challenges with Long-Term and Sustainable Funding

The Taskforce successfully secured funding from the Substance Abuse and Mental Health Services Administration. However, most of the interviews mentioned the need for more long-term funding to maintain efforts for training, employee and volunteer compensation, research, evaluation, and more. One participant stated,

> *"The Taskforce persists through all these years, but let's face it. How much can you do with no funding versus big funding? It has to be something sustainable, and we can't just continue relying on these rolls the dice, cross your fingers, kind of federal grant opportunities. The State really has to put that investment in too so that we're not constantly in this kind of up-and-down thing with the resources."*

3.2. Phase 2 (Survey)

The survey was sent to all members of the Taskforce listserv, which included 239 individuals. Out of these individuals, 58 members were considered active and attended multiple meetings per year. A total of 34 participants responded to the survey, which is a 59% response rate (see Table 3). Most survey respondents (62%) were 45 to 64 years of age and identified as female (59%). The geographic representation was as follows: Honolulu County (62%), Kaua'i County (15%), Hawai'i County (12%), and Maui County (9%). The survey respondents were a diverse group of community members who represented various organizations or groups.

3.2.1. Involvement, Progress, and Importance

Survey respondents reported on their level of involvement with each strategy in the Strategic Plan (Table 4). The strategies of Hope and Help had the highest level of involvement, with the majority of participants reporting that they were "Already very involved" (65% and 47%, respectively). Heal and Policy had more auxiliary engagement from participants, with the majority reporting that they "Assist/support others" (53% and 44%, respectively). Research had the lowest levels of involvement, with an equal number

of participants who were "Not involved but would like to be" (26%) and "Not involved, and not my area of focus" (26%).

Table 3. Prevent Suicide Hawai'i Taskforce evaluation survey participant demographics.

Variable	N (%)
Age Group	
44 years and under	9 (27)
45–64	21 (62)
65 and over	3 (9)
No response	1 (3)
Gender	
Female	20 (59)
Male	10 (29)
Other [1]	4 (12)
County	
Honolulu	21 (62)
Kaua'i	5 (15)
Hawai'i	4 (12)
Maui	3 (9)
No response	1 (3)
Organization/Group [2]	
Individual from community	26 (77)
Community/nonprofit or faith-based organization	15 (44)
State Agency	9 (27)
Military	9 (27)
Education	7 (21)
Healthcare organization	6 (18)
Business	4 (12)

[1] Transgender, non-binary/non-conforming, other, prefer not to respond/no response. [2] Participants were asked to select all that apply.

Table 4. Level of involvement, progress, and importance of each strategy.

Level/Rank	Strategy (%)				
	Hope	Help	Heal	Research	Policy
Involvement					
Already very involved	65	47	21	24	24
Assist/support others	26	38	53	24	44
Not involved, but would like to be	9	9	21	26	18
Not involved, and not my area of focus	0	6	6	26	15
Progress					
A lot of progress	52	39	15	21	42
Some progress	36	42	42	39	33
A little bit of progress	12	18	33	36	21
No progress at all	0	0	9	3	3
Importance					
1st	24	41	18	12	15
2nd	35	21	6	15	26
3rd	12	21	38	21	12
4th	18	12	18	18	29
5th	12	6	21	35	18

Survey respondents reported on the progress seen in each strategy (Table 4). Hope had the highest percentage of participants reporting some or a lot of progress (88%), followed by Help (81%), Policy (75%), Research (60%), and Heal (57%).

Survey respondents ranked the strategies in order of importance (Table 4). Help was ranked as first priority (41%), followed by Hope (24%), Heal (18%), Policy (15%), and Research (12%). Table 5 displays the summary of involvement, progress, and importance with Hope and Help being the most mentioned areas of the Strategic Plan. For the strategy that respondents ranked as the most important, they were asked to suggest a specific action step to make progress (Table 6). The most mentioned suggestion was to increase education through providing more classes, training, and resources.

Table 5. Summary of involvement, progress, and importance.

	Involvement [1] (%)	Progress [2] (%)	Importance [3] (%)
1st	Hope (91)	Hope (88)	Help (41)
2nd	Help (85)	Help (82)	Hope (24)
3rd	Heal (74)	Policy (76)	Heal (18)
4th	Policy (68)	Research (61)	Policy (15)
5th	Research (47)	Heal (58)	Research (12)

[1] % = Already very involved and Assist/support others. [2] % = A lot of progress and Some progress. [3] % = 1st.

Table 6. Specific action steps to make progress.

Specific Action Step	N (%)
Increase education through providing more classes, trainings, resources	13 (43)
Continue promoting positive messages of resilience/awareness	4 (13)
Foster ongoing partnerships within the Taskforce and community	4 (13)
Increase the number of mental healthcare providers and services	4 (13)
More research and evaluation	4 (13)
Increase advocacy efforts to change policy and gain more funding	4 (13)

3.2.2. Successes and Barriers

Survey respondents elaborated on their greatest success with the strategies they were involved in. Of the 29 comments, 38% related to success in collaboration and community-building, 38% to success in training, 34% to increase suicide prevention awareness and outreach, 10% to obtaining funding, and 7% to increasing research and evaluation. One respondent said,

> *"[My greatest success is] increasing my knowledge related to suicide awareness, as well as being able to share with others in our community of first responders along with various other stakeholders."*

Twenty-nine respondents commented on their greatest barrier in the strategies they were involved in. Themes that emerged included lack of funding, time, and resources (45%), challenges with outreach (14%), policy and organizational challenges (10%), lack of connection with communities (10%), personal difficulties (7%), difficulty working with providers (3%), and difficulty working with survivors or individuals in a suicidal crisis (3%). As one respondent commented,

> *"[The greatest barriers are] time, money, resources, and the need to duplicate myself. . .."*

3.2.3. Communication and Collaboration

Approximately 44% of respondents characterized the overall level of communication within the Taskforce as Excellent (Table 7). In relation to collaboration (Table 8), 29% selected Coalition, and 24% selected Coordination. The highest level, Collaboration, was selected by 12% of respondents.

Table 7. Levels of communication within the Taskforce.

Communication	N (%)
Excellent	15 (44)
Good	13 (38)
Fair	3 (9)
Poor	1 (3)
Extremely Poor	0 (0)
No answer	2 (6)

Table 8. Levels of collaboration within the Taskforce.

Collaboration	Description	N (%)
Collaboration	Members belong to one system; consensus is reached on all decisions	4 (12)
Coalition	Share ideas; all members have a vote in decision making	10 (29)
Coordination	Share information and resources; some shared decision making	8 (24)
Cooperation	Provide information to each other; decisions are made independently	3 (9)
Networking	Aware of each other's activities; decisions are made independently	4 (12)
None	No awareness or interaction	2 (6)
No answer	Respondent did not answer	3 (9)

3.2.4. Open-Ended Survey Responses

Seventeen respondents provided final comments. Themes that emerged included words of appreciation for the Taskforce (47%), words of appreciation for the evaluation (41%), and the need for more funding (18%). One respondent stated,

> *"I love this Taskforce and all of its accomplishments made throughout the years. I believe it has been helpful in getting awareness to our community and empowering many to give hope and help."*

3.3. Integration of Results

Integration of the Phase 1 (interviews) and Phase 2 (survey) databases revealed a confirmation of findings and new insights into the Taskforce and the Strategic Plan (Table 9). For the first evaluation question regarding successes and barriers, survey results confirmed the interview finding that there is much progress in the number of suicide prevention trainings available for diverse populations. However, the survey findings also revealed there is still room for growth for creating stronger connections with communities in Hawai'i. For barriers, there was a general consensus that increasing funding remains a top priority. For the second evaluation question regarding the five Strategic Plan areas, survey results confirmed interview findings that there was high involvement, progress, and prioritization of Hope and Help, and lower levels for Policy. While interview participants recognized the importance of Research, this area ranked low in involvement, progress, and priority in the survey. For Heal, while interviewees mentioned many events and resources for survivors, this area was ranked last in priority in the survey. For the third evaluation question, survey results confirmed interview findings that communication and collaboration is important but revealed that there is room for improvement in collaboration.

Table 9. Joint display.

Phase 1 (Interviews) Qualitative Results	+	Phase 2 (Survey) Quantitative Results	+	Phase 2 (Survey) Qualitative Results	→	Interpretation of Combined Data
Evaluation Question 1: What successes and barriers has the Taskforce faced?						
There has been much progress in the number and types of suicide prevention trainings for diverse populations.		Involvement: Hope (91%) and Help (85%) Progress: Hope (88%) and Help (81%)		Comments on greatest success: 38% related to collaboration and community-building Comments on greatest barriers: 14% outreach, 10% lack of connection with communities		There has been much progress in providing different kinds of suicide prevention training, but there is still room for growth by connecting with more communities in Hawai‘i.
The Taskforce faces challenges with organization in statewide suicide prevention efforts.		Level of communication: good to excellent (82%). Level of collaboration: High (41%), moderate (24%), low (21%), and none (6%)		No comments related to this theme.		Interviews identified potential issues with the Taskforce's organization. However, survey results indicated the majority of participants thought the Taskforce had good-to-excellent communication and moderate-to-high levels of collaboration.
COVID-19 presented challenges to Hawai‘i's communities and the Taskforce. However, the Taskforce responded with strength, creativity, and adaptability to continue its efforts.		Not measured.		No comments related to this theme.		COVID-19 presented challenges, but the Taskforce responded with creativity and adaptability.
The Taskforce faces challenges with long-term and sustainable funding.		Policy: Involvement (68%), Progress (76%), Importance (15%)		Comments on greatest barrier: 45% cited lack of funding, time, and resources Specific Action Steps: 13% cited increased advocacy efforts to change policy and gain more funding		Lack of funding is a significant issue raised in both the interviews and the survey.
Evaluation Question 2: What is the level of involvement, progress, and future priorities for the Taskforce in each area of the Strategic Plan						
Hope: The Taskforce is involved in multiple suicide prevention events to raise awareness. Social media addresses stigma and raises awareness through safe messaging.		Ranking of Hope: • Involvement: 1st • Progress: 1st • Priority: 2nd		Specific Action Steps: 13% cited continue promoting positive messages of resilience and awareness. Greatest successes: 38% in training, 34% increase in suicide prevention awareness and outreach		There is a lot of engagement and prioritization for Hope.
Help: The Hawai‘i Coordinated Access Resource Entry System has improved over the years, but can be made more accessible. There is a need for more services and community health providers in Hawai‘i's healthcare system.		Ranking of Help: • Involvement: 2nd • Progress: 2nd • Priority: 1st		Specific Action Steps: 43% cited increasing education through providing more classes, training, and resources, 13% increasing the number of healthcare providers and services		There is a lot of engagement and prioritization for Help; however, there is a need for more healthcare providers and services.
Heal: The Taskforce holds many events to support survivors of suicide loss. Survivor support must take into account healing is a period of grief and uncertainty.		Ranking of Heal: • Involvement: 3rd • Progress: 5th • Priority: 4th		Greatest barrier: 3% cited difficulty working with survivors or individuals in a suicidal crisis		Interviewees talked about many events and resources for survivors; however, progress in Heal was ranked last.
Research and Evaluation: The Taskforce understands the importance of research and evaluation. There are opportunities to have ongoing research studies and evaluations.		Ranking of Research and Evaluation: • Involvement: 5th • Progress: 4th • Priority: 5th		Specific Action Steps: 13% cited more research and evaluation		Key informant interviews recognized the importance of research and evaluation, but this area ranked low in involvement, progress, and priority in the survey.

Table 9. *Cont.*

Phase 1 (Interviews) Qualitative Results	+	Phase 2 (Survey) Quantitative Results	+	Phase 2 (Survey) Qualitative Results	→	Interpretation of Combined Data
Policy and Advocacy: The Taskforce has challenges with long-term and sustainable funding. While there has been progress in policy initiatives, there is a need for more suicide prevention advocacy.		Ranking of Policy and Advocacy: • Involvement: 4th • Progress: 3rd • Priority: 4th		Greatest barrier: 10% cited policy and organizational challenges Specific Action Steps: 13% cited increasing advocacy efforts to change policy and gain more funding		There is low engagement and priority, but the Taskforce recognizes the need for policy and advocacy to gain funding.
Evaluation Question 3: What is the level of collaboration and communication in the Taskforce?						
Suicide prevention efforts are centered on building and sustaining relationships and partnerships with the community to achieve goals.		Level of communication: Good to excellent (82%). Level of collaboration: High (41%), moderate (24%), low (21%), and none (6%)		No comments related to this theme.		There is good communication but there is room for improvement in collaboration for an even larger impact.

4. Discussion

This evaluation aimed to learn the successes and barriers that Taskforce members experienced in their suicide prevention work in relation to the Strategic Plan. Through the interviews, we identified six themes. Survey results showed a high level of communication and collaboration within the Taskforce. The most progress was seen in Hope (89%) and Help (82%), and the least progress was in Research (61%) and Heal (58%). The Taskforce's greatest successes revolved around collaboration and community-building, and the greatest barriers were related to a lack of funding, time, and resources.

Our finding that partnerships and relationships are the Taskforce's greatest strengths aligns with previous research that suicide prevention efforts in Hawai'i require a strong foundation of trusting relationships [19,20]. In a study that interviewed community leaders and trainers, prioritizing relationships was identified as a key cultural need for the successful implementation of a suicide prevention program in Hawai'i communities [19]. The emphasis on fostering relationships likely contributes to the high level of progress seen in Hope and Help, which focuses on outreach and training, two areas that require strong interpersonal and community trust and understanding. The importance of relationship building is also highlighted in Goebert et al.'s 2018 study, where the authors emphasize four Native Hawaiian values at the core of suicide prevention work [20]. Cultivating the Hawaiian value of pilina, which highlights the importance of building connections and relationships, can enhance community resilience and help individuals navigate difficult times [19]. The community's perseverance was demonstrated when the COVID-19 pandemic introduced many challenges to suicide prevention efforts.

Our finding on the Taskforce's challenges related to lack of funding, resources, staff, and time is an issue faced by global and local suicide prevention efforts. Although suicide is a national leading cause of death, suicide prevention efforts are severely underfunded [21]. A scoping review of 64 studies on the facilitators and barriers of suicide prevention interventions found that a common barrier is a lack of time to engage in efforts because staff and volunteers have very demanding schedules [22]. When coupled with a lack of funding to compensate for these efforts, it creates a burden on suicide prevention advocates. Similarly, a local youth suicide prevention effort stated that long-term sustainability was an issue because their funding was awarded for only one year [23].

4.1. Recommendations

Based on the identified themes, the evaluation team made four recommendations to the Taskforce. The first is to continue to advocate for local governments to invest in long-term, sustainable funding for suicide prevention so the Taskforce can provide more community training, mental health resources, and compensation for members and volunteers. Second, the Taskforce can continue to build relationships within the Taskforce and community through effective collaboration and communication. This includes strength-

ening relationships with community leaders to advocate for legislation and funding for suicide prevention. Third, the Taskforce can gauge the level of interest in strategies that many Taskforce members are not currently involved in (Research and Policy) by conducting another survey with a larger sample. Lastly, the Taskforce can develop standard evaluations and research to track the progress of suicide prevention in Hawai'i.

4.2. Dissemination

Interview and survey findings were presented at two monthly Taskforce meetings on 16 December 2021 and 20 April 2023. The findings were well-received by Taskforce members, and the Taskforce restructured meetings and prioritized policy to more closely align with the Strategic Plan.

4.3. Strengths and Limitations

This evaluation used a mixed-methods approach, which provided rich, contextual information from a small number of key informants, along with feedback from the larger Taskforce. Additionally, the survey was adapted from the Taskforce's 2017 Strategic Planning Member Survey, which can continue to be used in subsequent evaluations to allow for analysis over many years.

This evaluation had several limitations. First, it primarily relied on the experiences and knowledge of Taskforce members and does not include the wider public who are impacted by suicide. While this can be a limitation, member opinion is highly valuable in informing the future direction of the Taskforce; it provides direction for further research incorporating the perspectives of other members of the community, which is expanded on in the following section. In addition, the survey sample size (n = 34) was small compared to the total number of people on the Taskforce listservs. However, this was unlikely to affect evaluation findings, given that the response rate was acceptable at 59%, when comparing it to the 58 active Taskforce members, and that a mixed-methods approach was utilized to triangulate the survey and interview findings. Question 13 of the survey had a high non-response rate (53%), likely because it was the last question that asked for "any final comments". Otherwise, missing data were not an issue for the rest of the survey questions, with high response rates between 82 and 100%. Questions with rates on the lower end were all open-ended.

5. Conclusions

This evaluation highlights the successes and challenges of suicide prevention efforts in Hawai'i and provides recommendations for the second iteration of the Strategic Plan in 2025. Future research considerations include developing formal and ongoing implementation and outcome evaluations with wider samples and objective measures to better understand the impact of Taskforce initiatives in Hawai'i.

Supplementary Materials: The following supporting information can be downloaded at: https://www.mdpi.com/article/10.3390/ijerph21050565/s1, Table S1: Taskforce's Five Strategies Handout; Figure S1: Survey.

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The Impact of the COVID-19 Pandemic and Lockdowns on Self-Poisoning and Suicide in Sri Lanka: An Interrupted Time Series Analysis

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Abstract: Evidence from high-income countries suggests that the impact of COVID-19 on suicide and self-harm has been limited, but evidence from low- and middle-income countries is lacking. Using data from a hospital-based self-poisoning register (January 2019–December 2021) and data from national records (2016–2021) of suicide in Sri Lanka, we aimed to assess the impact of the pandemic on both self-poisoning and suicide. We examined changes in admissions for self-poisoning and suicide using interrupted time series (ITS) analysis. For the self-poisoning hospital admission ITS models, we defined the lockdown periods as follows: (i) pre-lockdown: 01/01/2019–19/03/2020; (ii) first lockdown: 20/03/2020–27/06/2020; (iii) post-first lockdown: 28/06/2020–11/05/2021; (iv) second lockdown: 12/05/2021–21/06/2021; and (v) post-second lockdown: 22/06/2021–31/12/2021. For suicide, we defined the intervention according to the pandemic period. We found that during lockdown periods, there was a reduction in hospital admissions for self-poisoning, with evidence that admission following self-poisoning remained lower during the pandemic than would be expected based on pre-pandemic trends. In contrast, there was no evidence that the rate of suicide in the pandemic period differed from that which would be expected. As the long-term socioeconomic impacts of the pandemic are realised, it will be important to track rates of self-harm and suicide in LMICs to inform prevention.

Keywords: suicide; self-harm; Sri Lanka; COVID-19; pandemic; low- and middle-income country; global mental health

1. Background

The COVID-19 pandemic has led to substantial disruption around the world. Social isolation, financial strain, fears of contracting COVID-19, and the illness itself have all been linked to increased symptoms of anxiety, depression, and suicidal ideation in the community [1,2]. Yet the available evidence indicates that suicide rates did not increase during the early part of the pandemic [2–6] in most high-income countries. Initial evidence from Sri Lanka found that the number of people presenting to hospital due to self-harm by self-poisoning in the first five months of the pandemic was lower when compared to expected trends [7]. Similar reductions in hospital presentations due to self-harm in the early part of the pandemic have been reported internationally and may have reflected

difficulties in accessing healthcare services during the pandemic or the use of alternate sources of support [8].

As the world emerges from the acute phase of the pandemic, new concerns arise about the long-term psychosocial sequalae, and the impact on rates of self-harm and suicide. What research there is on this topic has largely been conducted in high-income countries. Less is known about the psychosocial impact of the pandemic on low–middle-income countries (LMICs). Sri Lanka is one such country and had the second-highest rate of suicide in the world in the mid-1990s [9]. This high rate has declined since then, largely due to falls in pesticide suicides due to bans on the sale of the most toxic products. However, suicide (now mostly by hanging) and self-harm by self-poisoning remain significant public health problems in the country [10–12]. Sri Lanka currently faces very significant economic problems, with increasing unemployment and greater numbers of people experiencing poverty [13,14]. Other LMICs face similar economic challenges [15]. Given these ongoing post-COVID socio-economic and other stressors, there are significant concerns that the initial fall in self-harm hospital admissions seen in the early part of the pandemic in Sri Lanka, may now be reversed, with possible rises in rates of suicide and self-harm in more recent months. Therefore, the objectives of this study were three-fold: (i) to explore if the initial reduction in hospital presentation for self-harm (by self-poisoning) was sustained once lockdown measures in Sri Lanka were rescinded and whether similar reductions were observed in subsequent lockdowns; (ii) to explore whether the impact of the pandemic on self-poisoning differed by sex, age, and type of poison ingested; and (iii) to describe rates of suicide in the country during the period 2016–2021. These findings are important for setting priorities for suicide prevention strategies in Sri Lanka and are likely to be informative for other South Asian and LMICs as well.

2. Methods

2.1. Setting

This study is based in Sri Lanka, a country with a population of 21 million (Census 2011). During the initial phases of the pandemic, there was a range of public health prevention measures introduced in Sri Lanka, including several nationwide lockdowns. The first national lockdown was introduced on 20 March 2020 and took the form of an island-wide continuous police curfew (i.e., all individuals had to strictly remain indoors). This was continued until late April, with brief periods when the curfew was lifted for a few hours on selected days and times, to allow people to leave their homes. Thereafter, there was a gradual reduction in periods of travel restriction, and on 28 June 2020, all national lockdown measures were lifted. Following this, there were public health measures to curb the spread of the virus, but travel restrictions were much less stringent than before. The second wave of COVID-19 in Sri Lanka started in October 2020. During the second wave, a quarantine curfew was imposed within the Western province only (population 2.3 million; 11% of the population of Sri Lanka), with people not being able to leave the Western province without permission, but these travel restrictions were much less strict than during the first wave. There was no quarantine curfew in the Central province or other parts of the country at the time, although in November–December 2020, a few small, localized areas in the Kandy district were isolated from time to time, which may have affected the patient population in the current study.

In the first quarter of 2021, most travel restrictions were removed. However, after the Sri Lankan New Year celebrations in April 2021, there was an additional wave of infections, which led to a second national lockdown from 12 May 2021 onwards. During this period, interprovincial travel was limited, but restrictions in travel were much less stringent compared to the initial curfew/lockdown, and there was no police curfew. This continued until 21 June 2021. With the resurgence of the new delta variant, interprovincial travel restrictions were imposed from August to late October 2021, but other than that, travel restrictions during this period were minimal. Safety measures were continued until the end of the year to prevent the spread of the virus.

During the above periods of island-wide lockdown and periods of travel restriction (2nd and 3rd wave), the government also restricted all legal sales of alcohol. However, anecdotal reports suggest that illicit alcohol production increased during this period.

Two sets of data were used for this analysis, one pertaining to hospital admissions for self-poisoning and the other to suicide deaths. The self-poisoning data used for this analysis were collected from the Teaching Hospital Peradeniya (THP) in the Kandy district in the Central province of Sri Lanka. The Kandy district mirrors the demographic profile of the country in terms of age and sex distribution, with a Sinhalese and Buddhist majority. National suicide data were obtained from the Department of Police, Division of Statistics, Sri Lanka.

2.2. Self-Poisoning Hospital Data

In 2020, a register was established to track the impact of COVID-19 on hospital admission for self-poisoning in Sri Lanka [7]. Data prior to the establishment of the register in June 2020 were collected retrospectively from medical records (referred to as Bed Head Tickets or BHTs) and the ward admission book and included data from January 2019. From June 2020 onwards, we have collected data on all persons presenting to THP for medical management of self-poisoning. All persons presenting to THP due to self-poisoning are admitted to the toxicology ward for medical treatment, and there were no changes to self-poisoning admission procedures due to the pandemic. During data collection, patients admitted due to self-poisoning were identified using the ward admission book and additional data were collected using BHTs. Using a standard extraction sheet, data were gathered from medical records for all persons admitted due to self-poisoning to the ward between January 2019 and December 2021. Data on date of admission, age/date of birth, sex, and type of poison ingested were collected.

2.3. Suicide Data

National suicide counts by age, sex, and method were obtained from the Department of Police, Division of Statistics, between 2016 and 2021. Data for 2016–2017 were available in a monthly format, whereas 2018–2021 data were available as cumulative quarterly data.

2.4. Data Management

All data cleaning and analysis were conducted in line with a pre-specified published analysis plan [16]. At the time of publishing our analysis plan, we only had self-poisoning data up to April 2021 and suicide data to 2020. The original analysis plan was restricted to assessing whether there was a temporary step change (i.e., level change) in the number of hospital admissions for self-poisoning during the lockdown period, after which the underlying trend would return to pre-pandemic levels. With the availability of additional data, we modified our original analysis plan to explore the impact of the second lockdown on self-poisoning rates.

2.5. Self-Poisoning Hospital Data

We included all patients who had a date of admission between January 2019 and December 2021 (date of data extraction: 31 May 2022). Patient age at admission was calculated using their date of birth (where available) or reported age. Consistent with our previous analysis of the same data, we categorised patients into young (<25-year-olds) and older (25+) individuals. We categorised poisoning into medicinal, agrochemicals, or plant/other based on the toxicological agent. Data were converted to weekly counts of hospital admissions for all people and stratified by age, sex, and method of poisoning. Weeks were coded to begin on Sunday and end on Saturday.

2.6. Suicide Data

The monthly suicide data for the years 2016 and 2017 were grouped into quarters, and quarterly suicide counts were calculated from the cumulative quarterly suicide data

available for 2018–2021. We categorised age into four groups (8–25, 26–35, 36–55, and 55+), which reflect the groups which have the most similar age-specific suicide trends, and the categories which have been used in the previous analysis of these data [11]. The method of suicide was categorised into three main groups (hanging, pesticide poisoning, and other methods).

2.7. Statistical Analyses

We graphically present weekly and quarterly changes in self-poisoning hospital admissions (January 2019–December 2021) and suicide (2016–2021). We present this by sex, age, and methods, as well as overall trends.

We examined changes in admissions for self-poisoning and suicide using interrupted time series (ITS) analysis [17]. Given the different time periods and frequency of data available for self-poisoning admission and suicide deaths, we had to define the pandemic/lockdown periods for each dataset slightly differently. For the self-poisoning hospital admission ITS models, we defined the lockdown periods as follows: (i) pre-lockdown: 1 January 2019–19 March 2020; (ii) first lockdown: 20 March 2020–27 June 2020; (iii) post-first lockdown: 28 June 2020–11 May 2021; (iv) second lockdown: 12 May 2021–21 June 2021; and (v) post-second lockdown: 22 June 2021–31 December 2021. The quarterly nature of the suicide data meant that we defined the intervention according to the pandemic period rather than the lockdown (i.e., pre-pandemic: Q1 (January–March) 2016–Q1 2020; pandemic period: Q2 (April–June) 2020–Q4 (October–December) 2021).

We conducted a series of ITS analyses by fitting Poisson regression models with a scale parameter to account for overdispersion. For the self-poisoning admission data, our outcome was the weekly number of self-poisoning hospital admissions. We fitted models for the overall number of presentations and then by age group and sex and by poison method. For the suicide data, our outcome was the quarterly number of suicide deaths, and we fit models by the overall number of suicide deaths and by age group, sex, and method. We used the *fp* function in Stata statistical software (version 16.1, StataCorp, College Station, TX, USA, 2017) to assess the model which fitted the data best in terms of incorporating longer-term time-trends which might be non-linear. We also fitted models with and without terms to account for seasonality and tested using a likelihood ratio test to see which of these models was a better fit for the data. We opted for the most parsimonious model that captured the major time trends and variations in the observations. In our statistical plan, we hypothesised that there would be a temporary step change (i.e., level change) in weekly hospital presentations, and, therefore, all our models on the self-poisoning datasets included a categorically coded predictor in the model which represents the different periods of the lockdown detailed above. Most fitted models were linear and did not require a term to account for seasonality. The equation for the self-poisoning admission data without accounting for seasonality was:

ln(episodes in weeks) = β0 + β1(time)+ β2(1st lockdown weeks) + β3(post-1st lockdown weeks) + β4(2nd lockdown weeks) + β5(post-2nd lockdown weeks).

Where *β1 (time*) takes into account the underlying trend prior to the pandemic starting, *β0* represents the baseline level at time=0, and *β2-5* is a binary variable which indicated whether the time period is one of the lockdown periods of interest. For the suicide outcome analysis, we only included one interruption term (*β2*) to indicate the pandemic period.

We tested for evidence of this temporary step change in overall self-poisoning hospital admissions by age and sex and by method. We report the effect of this predictor as a rate ratio (RR). If a temporary step change has occurred, the RR during the lockdown periods will be different (higher or lower) than pre-lockdown trends, but the post-lockdown period RRs will show no evidence of a difference. This would indicate a "bouncing back" effect.

For the suicide data, we hypothesised that there would be a step change after the onset of the pandemic and included a binary-coded variable to indicate this in our models. We used the mid-year population estimates for 2016–2020 from the Registrar General's Department, Sri Lanka, as an offset to calculate rates of suicide. These models were fit

using the same approach used for the hospital presentation data. We fitted models on overall rates by age, sex, and method.

2.8. Ethical Approval

Ethical approval for the register was obtained from the Ethics Review Committee of the Faculty of Medicine, University of Peradeniya, Sri Lanka.

3. Results

3.1. Hospital Admissions Due to Self-Poisoning, Peradeniya

There were 2259 hospital presentations for self-poisoning between 1 January 2019 and 31 December 2021, and BHT data were missing for 3% of cases. Table 1 provides basic descriptive data of the study sample by period.

Table 1. Basic descriptive data on self-poisoning patients admitted to Teaching Hospital Peradeniya (January 2019–December 2021) by pandemic lockdown periods.

	Pandemic Lockdown Period * n (%)				
	Pre-	**During 1st**	**Post-1st**	**During 2nd**	**Post-2nd**
Number of presentations	1157	141	579	53	329
Mean number of presentations/week	18	9	13	9	12
Patients with BHT data, n (%)	1115 (96.4)	131 (92.9)	576 (99.5)	53 (100)	323 (98.2)
Age in years–Median (IQI)	23 (18, 34)	26 (19, 39)	26 (19, 38)	24 (19, 31)	25 (19, 38)
Sex					
Male	479 (41.4)	66 (46.8)	268 (46.3)	26 (49.1)	143 (43.5)
Female	635 (54.9)	63 (44.7)	310 (53.5)	26 (49.1)	184 (55.9)
Missing	43 (3.7)	12 (8.5)	1 (0.2)	1 (1.9)	2 (0.6)
Time of attendance					
00:00–07:59	130 (11.2)	11 (7.8)	62 (10.7)	2 (3.8)	28 (8.5)
08:00–15:59	354 (30.6)	55 (39.0)	227 (39.2)	22 (41.5)	140 (42.6)
16:00–23:59	628 (54.3)	64 (45.4)	285 (49.2)	28 (52.8)	158 (48)
Missing	45 (3.9)	11 (7.8)	5 (0.9)	1 (1.9)	3 (0.9)
Psychiatric assessment conducted					
Yes	1035 (89.5)	125 (88.7)	546 (94.3)	52 (98.1)	304 (92.4)
No	56 (4.8)	6 (4.3)	25 (4.3)	0 (0)	22 (6.7)
Unknown	66 (5.7)	10 (7.1)	8 (1.4)	1 (1.9)	3 (0.9)
Assessment performed by					
No assessment	56 (4.8)	6 (4.3)	52 (9.0)	3 (5.7)	23 (7.0)
Consultant	42 (3.6)	11 (7.8)	58 (10.0)	2 (3.8)	7 (2.1)
Registrar	403 (34.8)	57 (40.4)	302 (52.2)	34 (64.2)	165 (50.2)
Senior registrar	60 (5.2)	12 (8.5)	9 (1.6)	0 (0)	2 (0.6)
Medical Officer	501 (43.3)	45 (31.9)	148 (25.6)	11 (20.8)	123 (37.4)
Unknown	95 (8.2)	10 (7.1)	10 (1.7)	3 (5.7)	9 (2.7)
Current psychiatric diagnosis					
Yes	533 (46.1)	69 (48.9)	201 (34.7)	18 (34)	119 (36.2)
No	480 (41.5)	53 (37.6)	274 (47.3)	29 (54.7)	155 (47.1)
Unknown	144 (12.4)	19 (13.5)	104 (18.0)	6 (11.3)	55 (16.7)
Method					
Medicine	696 (60.2)	68 (48.2)	351 (60.6)	35 (66)	186 (56.5)
Agrochemical/pesticide/insecticide	225 (19.4)	42 (29.8)	140 (24.2)	12 (22.6)	58 (17.6)
Plant/other	194 (16.8)	21 (14.9)	86 (14.9)	6 (11.3)	84 (25.5)
Missing	42 (3.6)	10 (7.1)	2 (0.3)	0 (0)	1 (0.3)

* Pre-pandemic (1 January 2019–19 March 2020); During 1st lockdown (20 March 2020–27 June 2020); Post-1st lockdown (28 June 2020–11 May 2021); During 2nd lockdown (12 May 2021–21 June 2021); Post-2nd lockdown 22 June 2021–31 December 2021). BHT—Bed Head Ticket. IQI—Interquartile interval.

Figure 1 shows the overall number of hospital admissions for self-poisoning. The ITS indicates that during all lockdown (during and post) periods, there was a reduction in the number of hospital presentations for self-poisoning, which is over and above a steady

long-term reduction in presentations following self-poisoning. The largest reductions in admissions were during the lockdown periods, where a 50% reduction was observed during both lockdowns (first lockdown: RR 0.54 95% CI 0.44, 0.67; second lockdown: RR 0.55 95% CI 0.37, 0.81) (Table 2). The number of admissions did not return to pre-pandemic levels after the lockdowns were lifted.

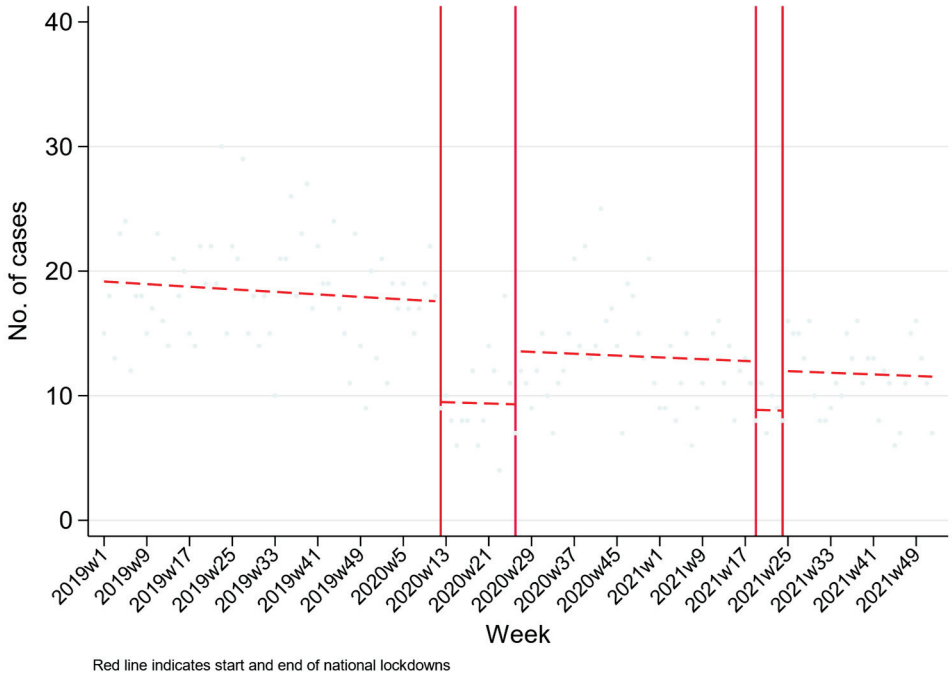


Figure 1. Changes in hospital presenting self-poisoning in Teaching Hospital Peradeniya, Sri Lanka, between January 2019 and December 2021.

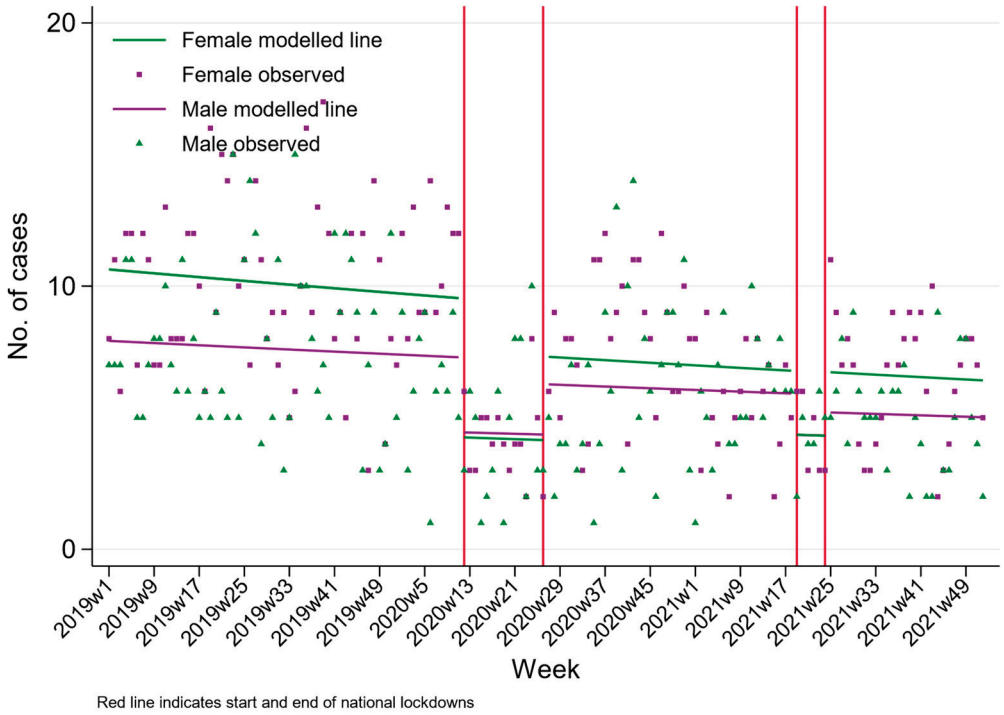
Table 2. Rate ratios for the difference in the number/rate of admission during the different lockdown periods compared to a pre-pandemic period.

	Lockdown Periods *—Step Change IRR (95% CI)			
	During 1st	**Post-1st**	**During 2nd**	**Post-2nd**
Overall	0.54 (0.44, 0.67)	0.79 (0.63, 0.99)	0.55 (0.37, 0.81)	0.75 (0.53, 1.05)
Sex				
Female	0.45 (0.34, 0.59)	0.79 (0.60, 1.04)	0.51 (0.31, 0.84)	0.79 (0.52, 1.21)
Male	0.61 (0.43, 0.86)	0.88 (0.61, 1.27)	0.65 (0.34, 1.21)	0.78 (0.44, 1.37)
Age group in years				
<25	0.44 (0.32, 0.60)	0.74 (0.54, 1.00)	0.54 (0.32, 0.93)	0.71 (0.44, 1.13)
25+	0.62 (0.46, 0.83)	0.93 (0.68, 1.27)	0.63 (0.36, 1.08)	0.90 (0.55, 1.45)
Methods				
Medicinal	0.45 (0.32, 0.62)	0.85 (0.63, 1.16)	0.66 (0.38, 1.15)	0.76 (0.47, 1.23)
Agrochemical	0.79 (0.53, 1.18)	0.81 (0.51, 1.28)	0.49 (0.22, 1.10)	0.50 (0.24, 1.03)
Plant/other	0.63 (0.40, 0.99)	0.60 (0.37, 0.96)	0.40 (0.15, 1.06)	0.86 (0.43, 1.72)

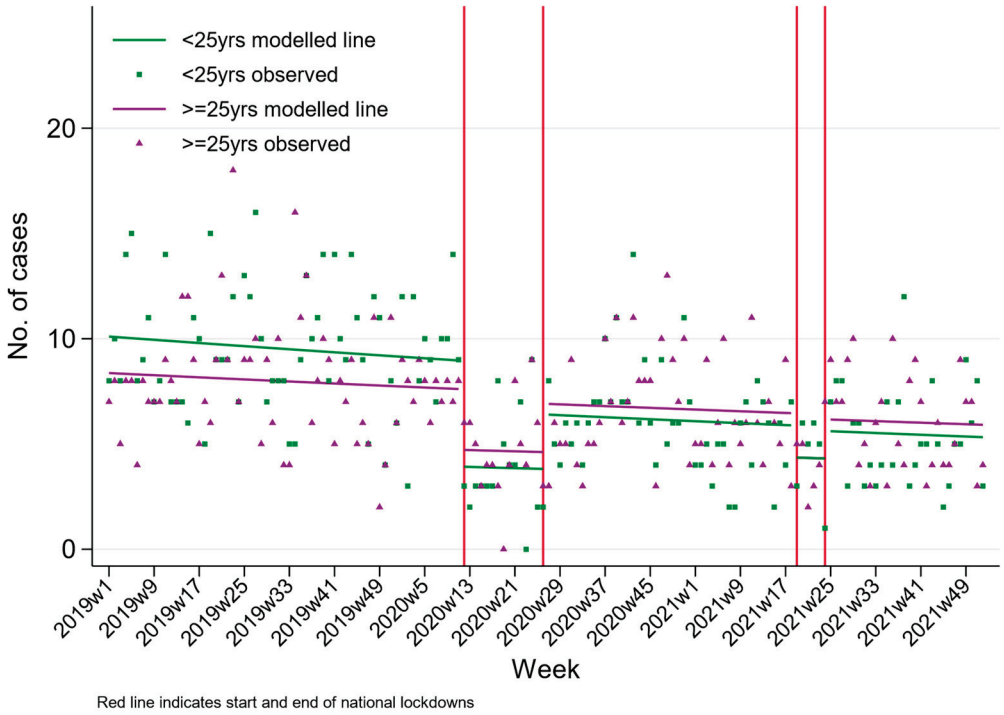
* Pre-pandemic (1 January 2019–19 March 2020); During 1st lockdown (20 March 2020–27 June 2020); Post-1st lockdown (28 June 2020–11 May 2021); During 2nd lockdown (12 May 2021–21 June 2021); Post-2nd lockdown 22 June 2021–31 December 2021).

Figure 2 presents the rate of self-poisoning hospital admissions by sex and age group. During the first lockdown, the rate of hospital admissions for self-poisoning dropped in each sex and age stratum, and we observed a similar reduction in the second lockdown compared to pre-pandemic trends (Table 2). The model estimates when stratified by sex and age are consistent with a temporary step change in rates of self-poisoning admissions. There was also evidence of a temporary step change in the number of hospital admissions

for medicinal poisoning during the first pandemic (Figure 3 and Table 2) but not the second. We also observed a reduction in the number of hospital presentations for plant and other poisonings during the period between the first and second lockdown (RR 0.55 95% CI 0.33, 0.91).



(**a**)



(**b**)

Figure 2. Changes in the rates of hospital presenting self-poisoning in Teaching Hospital Peradeniya, Sri Lanka, between January 2019 and December 2021 by (**a**) sex and (**b**) age group.

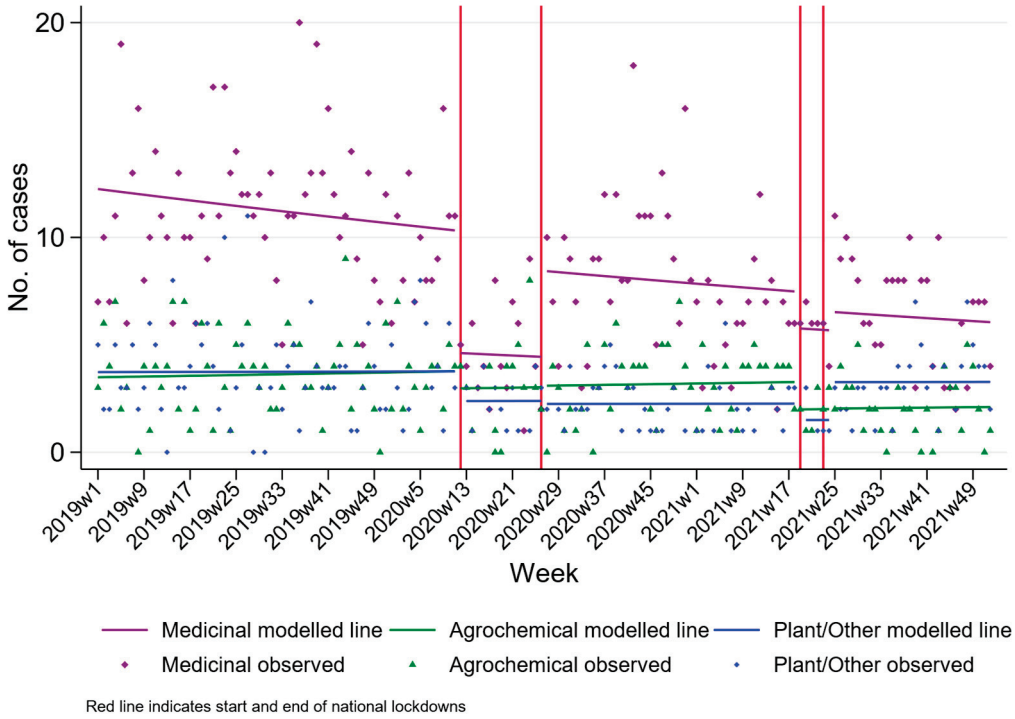


Figure 3. Changes in hospital presenting self-poisoning in Teaching Hospital Peradeniya, Sri Lanka, between January 2019 and December 2021 by poison type.

3.2. Suicide Numbers, Nationwide

A total of 18,979 people died by suicide between 2016 and 2021 in Sri Lanka. The crude rate of suicide in Sri Lanka in 2021 was 17.1 per 100,000 (95% CI 16.5, 17.8 per 100,000). The age and sex profile of deaths were similar during the pandemic periods (Table 3). Figures 4–6 present the rate of suicide during the study period. The ITS models found limited statistical evidence of a step change in the rate of suicide during the pandemic compared to the pre-pandemic trends, with the exception of those aged 26–35 years. In this group, there was statistical evidence of a 26% reduction in the rate of suicide during the pandemic (RR 0.74 95% CI 0.54, 1.00). Suicide rates were consistently higher among males and more common in older compared to younger persons. Although the overall number of suicide deaths has remained relatively constant (mean 3163, SD 105), there was an upward trend of suicide by hanging, with the highest observed number of suicide deaths by hanging being at the end of 2021.

Table 3. Basic descriptive data on suicide by pandemic lockdown periods and rate ratios for differences in the rate of suicide during the pandemic compared to a pre-pandemic period.

	Pandemic Period n (%)		
	Pre-	**During**	**IRR (95% CI)**
Overall	13,405	5574	0.9 (0.68, 1.19)
Sex			
Female	2797 (20.9)	1093 (19.6)	0.98 (0.84, 1.14)
Male	10,608 (79.1)	4481 (80.4)	0.89 (0.69, 1.16)
Age group in years			
8–25	2563 (19.1)	1057 (19)	0.97 (0.83, 1.13)
26–35	2237 (16.7)	936 (16.8)	0.77 (0.56, 1.06)
36–55	4281 (31.9)	1689 (30.3)	0.94 (0.82, 1.07)
55+	4324 (32.3)	1892 (33.9)	1.05 (0.91, 1.21)
Methods			
Hanging	3421 (25.5)	1091 (19.6)	0.96 (0.75, 1.23)
Poisoning	7636 (57)	3619 (64.9)	0.97 (0.82, 1.15)
Other	2348 (17.5)	864 (15.5)	1.01 (0.75, 1.36)

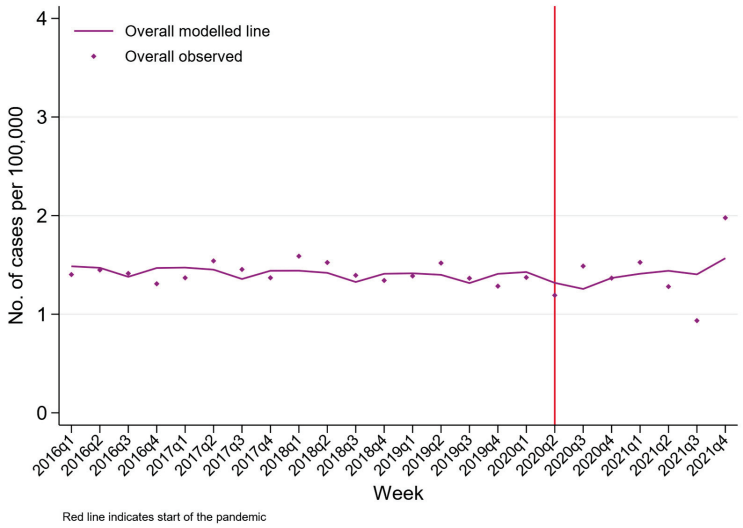
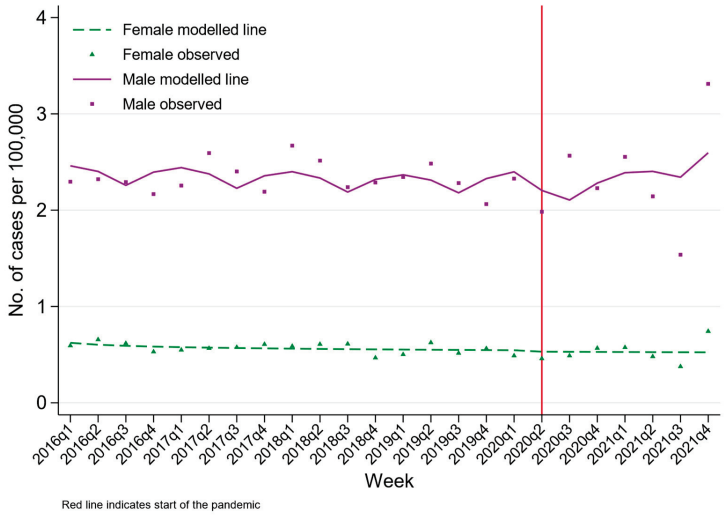
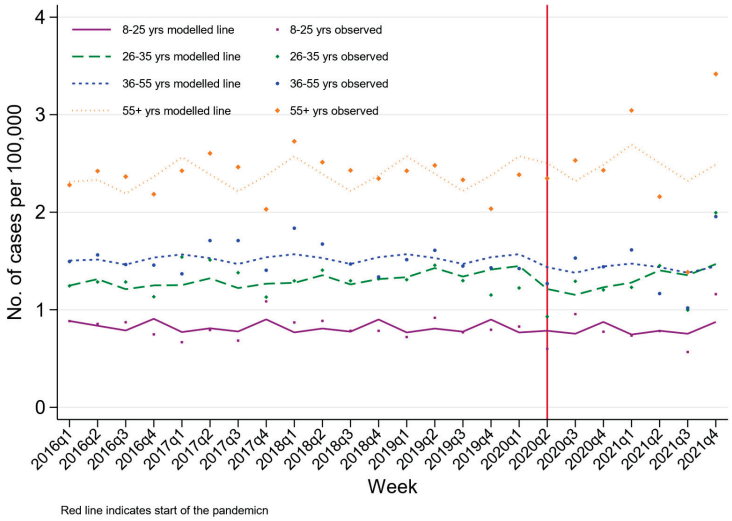


Figure 4. Changes in crude suicide rates in Sri Lanka between 2016 and 2021.



(**a**)



(**b**)

Figure 5. Changes in crude suicide rates in Sri Lanka between 2016 and 2021 by (**a**) sex and (**b**) age group.

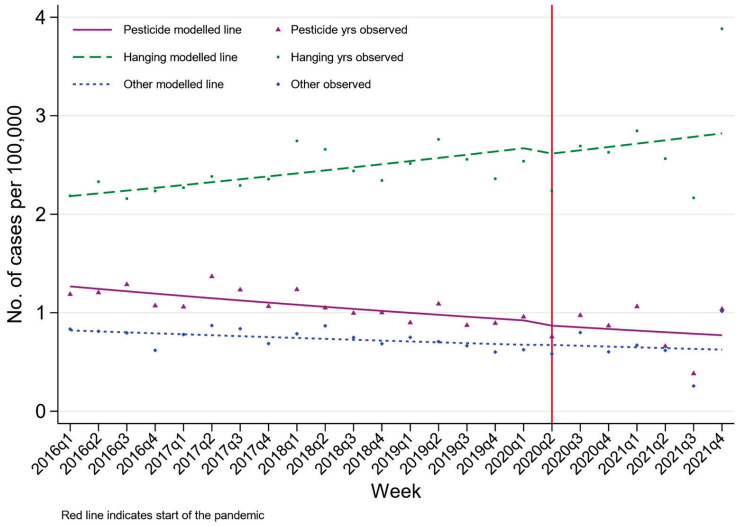


Figure 6. Changes in crude suicide rates in Sri Lanka between 2016 and 2021 by method.

4. Discussion

This study provides data on the impact of the pandemic and associated lockdowns on self-poisoning and suicide in a lower–middle-income country. We found that during the lockdown periods, there was a reduction in hospital presentations for self-poisoning, with evidence that presentation to services following self-poisoning remain lower during the pandemic than would be expected based on pre-pandemic trends. This pattern was seen in all sub-group analyses (i.e., by sex, age, and method), although small numbers in particular strata meant that there was not always statistical evidence of a reduction. In contrast, there was no evidence that the rate of suicide in the pandemic period differed from that which would be expected based on pre-pandemic trends.

4.1. Hospital Presenting Self-Poisoning

The finding of a temporary decrease in the number of hospital presentations due to self-poisoning, during each lockdown period is similar to reported findings internationally, where lockdowns have been associated with reduced hospital presentations for self-harm [8]. Difficulty accessing services due to travel restrictions, limited access to means of self-harm (most often medication), increased numbers of family members within the home, and seeking alternate sources of support may have all contributed to the reduced number of presentations [8].

During the first lockdown, we also observed a significant drop in the number of people presenting with self-poisoning from medicinal overdoses (compared to other substance ingestion). The drop in medicinal overdoses in the first lockdown may go hand-in-hand with a greater reduction in the number of young people (<25 years) presenting to hospital due to self-poisoning compared to older persons – young people may have been less able to travel during strict lockdown periods, and previous evidence from Sri Lanka has indicated that medicinal overdoses are relatively more common in younger people, whereas pesticide ingestion is more often seen in older people [18].

There were concerns as to whether the reduced hospital presentations due to fears of contracting COVID-19, during the periods of lockdown hid ongoing self-harm within the community, which did not present to healthcare services. However, we found that after lockdowns were lifted, the levels of hospital admissions due to self-poisoning did not rise above pre-pandemic trends, with evidence that they were lower than levels before the onset of the pandemic. The reasons for this are unclear. This might reflect ongoing concerns over the risk of infection in a hospital, though we do not have any data to be able to confirm this.

Prior to the pandemic starting, there is evidence of a gradual decline in self-poisoning that present to hospital. Again, the reasons for this are unknown, but it could be that self-poisoning was gradually becoming less common as a method of self-harm and that other methods were being adopted, e.g., such as self-cutting, which are less likely to present to services. Another more worrying potential possibility is that method switching in self-harm has been to potentially more lethal methods, such as hanging. Any method substitution to potentially more lethal methods, even by those attempting self-harm impulsively with short premeditation, is of serious concern and this possibility warrants further exploration. Sri Lanka, similar to many other LMICs, is currently facing significant socio-economic problems and worsening levels of poverty [15]. Socio-economic stressors, early school drop-out, and unemployment are risk factors for self-harm, especially for young people, and in this context, ongoing monitoring of rates of self-poisoning and self-harm is of importance [4,19,20].

4.2. Suicide

We found that the number of suicide deaths nationwide remained relatively constant between 2016 and 2021, with limited evidence of a step change in incidence during the pandemic compared to the pre-pandemic trends. This is in keeping with international work which reported no increase in suicide rates during the early phase of COVID-19, although our work reflects both the early and late part of the pandemic [3,21].

The most common method of suicide from 2016 onwards in Sri Lanka has been by hanging, with suicide being more common among older people and males, in keeping with trends of suicide worldwide [22]. This is a shift from the patterns of suicide seen in Sri Lanka in the 1990s and early 2000s when the country saw a very high rate of suicide mostly commonly by pesticide ingestion, and more commonly among young males [23]. – this occurred at a time when toxic pesticides were widely available in the community. Subsequently in the mid-1990s, national measures were taken to restrict the availability of toxic pesticides, and furthermore, the import of all pesticides was banned for a period during 2021 [10,24]. The gradual increase in the number of suicide deaths by hanging, seen throughout the study period is likely to reflect an underlying shift in method choice and some degree of method substitution [25].

Sri Lanka, akin to many other developing countries, is now facing an unprecedented economic crisis in the wake of the pandemic. Risk factors for suicide, such as socio-economic stressors, increasing levels of poverty and unemployment, and associated debt are already on the increase [4,19,26,27]. This is likely to go hand-in-hand with other triggers for self-harm and suicide, such as relationship strains, interpersonal conflict, depression, and increasing substance misuse [28–30]. Vulnerable groups, such as the elderly, young people, those below the poverty line, and those with psychiatric morbidity will be at increased risk [30]. Closely monitoring suicide and self-harm will be imperative going forward.

4.3. Strengths and Limitations

This is one of the very few studies investigating the impact of the pandemic on suicide and self-harm in populations living in LMICs [6] and presented data on both self-harm and suicide. It includes data from several years and is able, therefore, to model underlying trends. We conducted our analysis using a pre-registered analysis plan and have indicated when we have deviated from this. Despite these strengths, there are methodological limitations which need to be considered when interpreting the findings of this study. Firstly, the data for self-poisoning was obtained using hospital admissions to a large tertiary care hospital in the Central province of the country and, therefore, may not reflect self-harm in all parts of the country. Secondly, we only have access to data on people who presented to hospital after their self-harm, and we do not know whether self-harm in the community has changed during the pandemic period. Thirdly, data for rates of suicide were available in monthly or quarterly intervals and, therefore, we were unable to assess the impacts of

lockdowns on suicide rates. Lastly, we were also not able to compare variations of suicide numbers by province, which is a limitation.

5. Conclusions

Despite concerns, available data internationally suggest that there has been no increase in the rates of suicide during the pandemic, and our findings from Sri Lanka are in keeping with this [3,6]. During the pandemic period of 2019–2021, admissions for self-poisoning showed an overall decreasing pattern, with temporary step reductions during the periods of lockdown. There was evidence that the number of hospital admissions for self-poisoning remained lower than would have been expected during non-lockdown pandemic periods. The overall rates of suicides nationwide during 2016–2021 did not show an increase during the pandemic. However, a significant red flag for concern is the upward trend of suicide by hanging, which appears to be independent of the pandemic. Similar suggestions of recently increased rates of suicide by hanging have also been reported from neighbouring India [31].

The negative socioeconomic consequences of the pandemic are starting to be realised in many countries. In this context, it is imperative to continue to closely monitor the rates of self-harm and suicide in Sri Lanka and other LMICs, which are the nations likely to experience the worst of these adversities. Taking universal, multi-pronged pre-emptive actions which go beyond the healthcare sector—such as measures for debt relief, job restructuring, and responsible media reporting of suicide—together with targeted identification and support for vulnerable groups, such as the elderly and those with psychiatric morbidity, may help in preventing an increase in suicide rates [1,2,27,32]. These strategies are worth exploring further and findings are likely to have implications for many LMICs.

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Data Availability Statement: Suicide data can be obtained directly from the Police department in Sri Lanka. All other data are available from the authors.

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Article

Gendered Antecedents and Consequences of Young Women's Suicidal Acts in Sri Lanka

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Abstract: In the late 1990s, Sri Lanka had a record rate of suicide deaths. Since then, deaths have decreased dramatically due to the restriction of lethal agrochemicals. The number of nonfatal suicidal acts, however, remains extraordinarily high. A disproportionate number of these cases are adolescents and young adults—mainly girls and young women. This paper offers a close look at adolescent girls in rural Sri Lanka who had engaged in nonfatal suicidal acts. We carried out interviews with daughters and mothers while the girls were receiving medical care following a suicidal act. Drawing from these interviews, we describe the circumstances leading to girls' suicidal acts, the responses and moral judgments made by adult family members, and the reputational and social consequences of these acts. Few girls intended to die; none had previously undertaken a suicidal act, and none gave evidence of "mental illness". In many cases, girls' suicidal acts were triggered by acute family conflicts, often concerning situations that were seen to compromise the girl's sexual respectability and the honor of her family.

Keywords: suicidal acts; Sri Lanka; adolescent girls; gender norms; sexual respectability

1. Introduction

Every culture has a canonical narrative of suicide. Such narratives constitute a shared understanding of why people take their own lives. The narrative serves as a template that organizes suicidal acts undertaken by members of that culture [1]. It gives meaning to such acts as well as a moral accounting of them. Such narratives also shape the ways in which others relate to individuals who have engaged in a suicidal act. In Western high-income countries, the canonical narrative of suicide is provided by biomedical psychiatry. Suicidal behavior is said to be caused by a mental disorder, especially depression. Indeed, the fifth edition of the Diagnostic and Statistical Manual of Mental Disorders [2], as well as its subsequent updates, proposed a new diagnostic category, Suicidal Behavior Disorder [3]. However, although the claim that suicide is caused by a mental disorder is often stated as if it were a universal truth, research carried out by medical anthropologists and cultural psychologists reveals many other canonical narratives (e.g., [1,4–7]).

This article concerns a cultural setting in which the canonical narrative of suicide does not link it to clinical depression or to any other mental disorder. This setting is Sri Lanka, a small island nation off the southeastern coast of India. There, the everyday understanding of suicidal acts is that those acts are driven by anger, by the desire to cast blame and shame on another person, or by a wish to "scare" others into doing one's bidding. Such acts (or threats of such acts) are quite common among both women and men, and across the age span from mid-adolescence to old age. Neither psychiatrists, medical personnel, family members, nor individuals who have engaged in suicidal acts regard such acts as symptomatic of mental disorders. Following a suicidal act, individuals are typically admitted to medical wards; their physical symptoms are treated, and they are discharged. Especially if they are young, they may be deemed as "foolish", "hotheaded", or "uneducated"—bad but not mad.

Some 25 years ago, Sri Lanka recorded 47 suicide deaths per 100,000, a death rate that was entered in the Guinness Book of World Records [8]. Most of these deaths resulted from the ingestion of agrochemicals, such as pesticides and weedicides, or poisonous plants, such as *kaneru* (yellow oleander). Following a sustained campaign to restrict the availability of lethal agrochemicals, the incidence of fatalities diminished dramatically [9]—a signal victory for the public health sector. However, the number of nonfatal suicidal acts did not decline; indeed, it may have increased [9]. Such cases are not tabulated in the national health statistics, nor consistently entered in hospital records. However, a door-to-door survey of households in the North Central province of Sri Lanka, a largely agricultural area, reported a rate of nonfatal self-harm of 560/100,000 [10].

It appears that adolescents and young adults constitute a large proportion of those who engage in nonfatal suicidal acts. Eighty-five percent of the cases reported in Pearson et al.'s household survey [10] involved adolescents and young adults. In the Teaching Hospital Karapitiya, where our studies were conducted, the medical records across several years showed that roughly 400 adolescents who had engaged in suicidal acts were admitted every year. In each year, girls outnumbered boys by roughly three to one [11]. Nearly all the adolescents (roughly 97%) survived. Some of the cases were not medically inconsequential, however. Some patients had swallowed substances such as bleach, rat poison, toilet cleaner, and kerosene oil, or they had ingested overdoses of various medications.

In Sri Lanka, many suicidal acts are not undertaken with an intention to die. In fact, many suicidal acts are organized in ways that make death very unlikely to occur. Therefore, the terms "attempted suicide" and "suicide attempt", which carry the meaning that the actor wished to die, are misleading. These terms—which are ubiquitous in research studies, in popular journalism, and in public information and education programs—erase the full range of motives and experiences of Sri Lankan individuals who engage in suicidal acts. Only a few of the girls who took part in our studies, for example, described themselves as intending to end their lives. Rather, their acts were meant as communications to others (and sometimes also about others). Tom Widger, a medical anthropologist who worked in the western coastal area of Sri Lanka, noted a similar pattern [12]. Drawing on his observations, Widger coined the term suicide-like act, which he defined as an act that was intended to put the idea of death into someone else's mind. In what follows, we use the terms suicidal act, suicidal behavior, and suicide-like act interchangeably. We avoid altogether the terms suicide attempt and attempted suicide.

Our goal was to study the meanings given to adolescent girls' suicidal acts in the cultural and social contexts in which they were situated. Drawing from a larger study of young people who were admitted to medical wards following a suicidal act, we selected for this analysis the subset of participants who were adolescent girls. The analysis drew on interviews with these girls and with their mothers.

We examined girls' accounts of the circumstances and experiences that prompted them to engage in suicide-like acts, looking for common themes. We also examined the ways that mothers viewed their daughters' suicidal acts. In mothers' eyes, what were the reasons and causes behind their daughters' suicidal acts? What moral judgments did mothers make about girls' actions and the actions of others who were involved? We also took note of mothers' and daughters' expectations and fears regarding the familial and societal consequences of a girl's suicide-like act. We scrutinized the strategies that mothers devised or contemplated in order to reduce the social harms and status injuries that might result from public knowledge of a girl's suicidal act.

Norms of Femininity and Girlhood in Rural Sri Lanka

Our knowledge interests centered on normative ideals of femininity, as well as the gendered and generational family relations that shaped girls' actions and others' responses. Here we provide a brief description of relevant aspects of feminine propriety and feminine ideals. We first discuss *læjja-baya* and the norms governing proper feminine de-

meanor [13,14]. Then we discuss the salience of marriage in young women's lives and the importance for families of negotiating a "good" marriage for their daughters.

The literal translation of *læjja-baya* is shame-fear—that is, a strong fear of being shamed. In Sri Lanka (and elsewhere in parts of South Asia), *læjja-baya* is a valued attribute, a quality that parents seek to inculcate in their offspring [14,15]. Beyond the fear of being shamed or criticized, the cultural ideal of *læjja-baya* also prescribes reticence, emotional restraint, and modesty, all of which are seen as key elements of proper public demeanor, especially for women. Further, girls and women ought to avoid actions that draw others' attention to themselves. For instance, overt displays of emotion—whether anger, sadness, loud laughter, or physical gestures of affection—are frowned upon; such displays draw attention to the self. Such prescriptive norms regarding emotional restraint are considerably more stringent for women and girls than for men and boys. Keeping one's emotions tightly in check is fundamental to proper female propriety and to a woman's respectability. De Alwis [16] has traced the emergence of this ideal of feminine comportment to the confluence of traditional Buddhist dogma regarding emotional control and the Victorian ideals of womanly virtue brought to Sri Lanka by its British colonizers.

We next consider the conventional meanings and practices of marriage in Sri Lanka. Although some members of the English-speaking urban elite have adopted the mores and practices typical of Western high-income societies, marriage (specifically, heterosexual marriage) remains the presumptive life status for adults in Sri Lanka. Indeed, getting marriage confers full adult status on a person. Most people expect and desire to be married and to have children. For the most part, being married, and having and raising children is a primary source of both personal identity and life satisfaction [17]. This is especially true for women. Moreover, marriage is more than the fulfillment of personal desire and romantic attraction; furthermore, having children is not solely a matter of personal preference. Both marriage and family formation are kin obligations—the obligation to carry the family lineage into the future. By longstanding tradition, parents bear responsibility for locating suitable marriage partners for their adult children and arranging for a marriage. By and large, young adults do not experience such parental involvement as intrusive or as an infringement on their autonomy; rather, it is a fulfillment of a pivotal family obligation [18].

For a young woman, marriage to a partner with good economic prospects or who comes from a prosperous family affords a means of upward economic mobility and higher social status for herself and her family. However, in order to strike a good match, a girl's reputation must be unsullied; it cannot be compromised by rumors of sexual improprieties, romantic entanglements, or disrespectable behavior. Nor can her family's background be tarnished by scandal. As we will see below, issues of reputational harm and scandal often came into play in the circumstances leading up to girls' suicide-like acts and to families' efforts to mitigate the consequences of these acts.

2. Method

The work we report here was carried out in the Teaching Hospital Karapitiya (hereinafter THK), located near the town of Galle in the southwest coastal belt of Sri Lanka. THK is the teaching hospital for the Ruhuna Medical Faculty and the only tertiary-care government hospital in the south of Sri Lanka. It is the third largest hospital in country. Because of its human resources and facilities, it is the referral center for the entire Southern province of Sri Lanka, serving mainly rural agricultural communities.

The analyses we report here focus on a subset of interviews drawn from a larger project concerned with young people's deliberate self-harm. The Institutional Review Board of the Faculty of Medicine of the University of Ruhuna reviewed the detailed protocol for the larger project and formally approved the project on 27 July 2007.

Chandanie Senadheera, a member of the Psychiatry Unit of THK and of the Ruhuna Medical Faculty teaching staff, was responsible for recruiting and interviewing participants for the study. Dr. Senadheera (hereinafter CS), who is a registered clinical psychologist, is the only psychologist in the hospital and on the Medical Faculty.

2.1. Inclusion Criteria and Recruitment Procedure

The criteria for inclusion in the larger study were as follows: (1) the individual was admitted to the medical ward of the THK for inpatient treatment following an episode of self-harm; (2) the individual was between the ages of 15 and 18; (3) the individual's medical condition had stabilized; (4) the individual agreed to be interviewed; and (5) a parent or an adult relative consented to the child's participation. With the adolescent's permission, CS invited their parent to be interviewed as well.

With the assistance of the staff on the medical ward, CS monitored admissions to the ward. She met adolescents who had been hospitalized following a suicidal act after their medical condition had stabilized and invited them to take part in the study. Every patient admitted for a suicidal act who met the age criterion was invited to join the study. No one declined.

2.2. Characteristics of the Study Group

In this paper, our focus is on the girls who were part of the larger project. We selected for analysis all the girls between the ages of 15 and 18 (N = 22). Thirteen of the girls were 15 or 16 and nine were 17 or 18. All but one came from Sinhala families, and all were at least nominally Buddhist. Nearly all their families lived in rural areas, as do 80% of Sri Lankans. Farm work and fishing were common means of livelihood. This means that household incomes varied widely and unpredictably in accordance with the season and the weather. Some fathers were in the military and others worked as migrant laborers in the Gulf States. Most mothers were not in the paid labor force, though some mothers worked as casual laborers on tea plantations or as sewing machine operators in garment factories. Most families lived in one-story houses with two or three rooms; most houses had electricity, but few had piped-in water. No family owned an automobile.

All the girls had at least one sibling; most had two or more. None of the parents were divorced or formally separated, although a few fathers were deceased. As is often true in Sri Lanka, many girls had members of their extended family living nearby or even in the same household. All but two of the girls were in school (in one case, a girl had recently been forced to leave school to take a job because her father had unexpectedly died).

Girls were asked for permission to interview their mothers as well. Every girl agreed to this. In Sri Lanka, female family members are expected to provide clean clothing, bed linens, and meals for hospitalized family members; moreover, it is customary for mothers to stay overnight with their daughters. Therefore, mothers were readily available both to be asked to consent to their daughters' participation in the study and to be interviewed.

2.3. Interview Procedures

Interviews were conducted in a private office away from the ward. All the interviews were conducted in Sinhala. Prior to the actual interview, the formal process of obtaining informed consent took place. CS introduced herself and explained that she wanted to learn more about the circumstances that led young people to engage in self-harm. She informed potential participants that their participation was voluntary; that they could choose not to answer any items if they wished; that they could withdraw from the interview at any time; and that the contents of the interview would remain anonymous and confidential. In addition to the oral description of the study, every participant was given a paper summarizing this information. Mothers and daughters independently provided written consent.

2.4. Interview Format and Content

Daughters and their mothers were interviewed separately. Both daughters and mothers were told that nothing they said would be disclosed to the other party. The interviews were semi-structured. In the first segment of the interview, the questions/items were mainly open-ended. The goal was to gather rich talk that detailed the events leading up to the act of self-harm; the circumstances of the act itself; the thoughts and feelings the girl had when she decided to undertake a suicide-like act; and what had happened subsequently. CS

opened the interview by asking simply "What happened?"—a question that implicitly asks for a narrative. As girls told their stories, CS used prompts and probes to help girls amplify their accounts. (E.g.: For how long had [the problem] existed? Do you remember what you were thinking about? How were you feeling? For how long did you think? Was anyone near you? Did anyone else know that you intended to harm yourself? Was there anything else you could have done? What did you think would happen? How did [your family] react when they realized what you had done? How/when did you get to the hospital? How has it been in the hospital?). The second segment of the interview was more structured. Girls were asked about their expectations of what would take place when they left the hospital (e.g., How do you think others—parents, other family members, neighbors, school friends—will treat you? Do you expect any changes in your life or in your relationships with others?). Girls were also asked if they knew others who had engaged in suicidal acts. Most said they did. They were asked to give a brief recounting of each of those acts and the aftermath. The mothers' interviews covered similar topics as the daughters' interviews, with the questions worded similarly. In many cases, mothers were cognizant of the angry responses and inflammatory suspicions that the girl's suicidal act had engendered in the girl's father and elder brothers. Mothers were also very attuned to the reputational harm that would follow if a girl's suicidal act were publicly known.

Most interviews lasted between 45 min and an hour. They were audio-recorded, transcribed, and then translated into English.

2.5. Data Analysis

Both authors read the transcripts several times, working with both the original Sinhala and the English translation. In these readings, they made notes on "repeating ideas", that is, ideas expressed by many of the participants [19]. We sought to understand the culture-specific meanings and moralities which daughters and mothers drew on to make sense of the girl's suicide-like act. We also sought to identify common aspects of the circumstances that girls said had provoked their suicidal acts. Furthermore, we took account of the consequences—feared and actual—mentioned by girls and their mothers. Of course, we had no way to ascertain whether or not daughters' or mothers' accounts were fully accurate or fully truthful; our goal, however, was not to ferret out "the truth".

In what follows, all names are pseudonyms. Other possible identifying information, such as the names of villages or particular temples, have been changed or removed.

3. Findings

3.1. Overview

The descriptions that daughters and mothers gave of the girls' suicidal acts included several features that set these acts apart from both completed suicides or attempted suicides. Most girls described their actions as largely unpremeditated. Sixty-five percent of them reported that they contemplated their suicidal act for 30 min or less. Only two girls reported contemplating the suicide-like act for as long as one day. In nearly every case, the girl's home was the site where the suicidal act took place, and other family members were at home at the time. For the most part, the girls made minimal efforts (if any) to conceal what they had done. Some left empty pill bottles or empty cards of Paracetamol tablets in plain sight. Some had enlisted a little sister or brother to purchase cards of Paracetamol tablets at the neighborhood shop. Many girls very soon disclosed to their mother what they had done. In a few cases, such as the two that follow, girls dramatically enacted the self-harming act in others' presence.

Vimala (age 15) argued with her mother about whether or not she had "talked to" a boy on the bus ride home from school. Although Vimala said her mother's accusation was false, her mother refused to believe her. "My head got hot", Vimala said, "and it felt like it would explode". She went to the back of the house, doused herself with kerosene oil, and, with a box of matches in hand, returned to face her mother.

Sunila (age 16) realized that the neighborhood gossips had observed her alighting from the bus with a boy behind her. Knowing that she was in for a severe scolding from her home people, she tore through the house, screaming, "I'll kill myself, I'll kill myself". In the kitchen area outside the back of the house, she quickly gulped some kerosene oil.

In our reading of the circumstances of girls' suicide-like acts, we see little evidence that the girls intended to die, or that they had a mental disorder, such as depression or borderline personality disorder (as a reviewer suggested). In no case had a girl previously engaged in a suicidal act. Moreover, in no case did the girl or her mother report that the girl had had previous psychiatric or psychological difficulties, a consultation with a mental health professional, or any form of psychological or psychiatric treatment. Indeed, many girls spontaneously reported that they had not intended their suicide-like act to end in death, but rather to force a change in someone else's behavior. Furthermore, CS, the interviewer, is a registered clinical psychologist attached to the hospital's psychiatry department. Had she observed signs or symptoms of a psychological disorder, she was authorized to refer a participant for a psychiatric evaluation.

3.2. Antecedents of Girls' Suicidal Acts

As has been consistently reported for over 20 years, suicidal acts (whether fatal or not) nearly always take place in the midst of interpersonal conflicts, usually involving family members [20]. This was also true for the girls who took part in this study. Their accounts of their suicide-like acts reveal that those acts were deeply embedded in girls' social fields. Their stories offer a window into both ongoing relations with the family and the shared norms and values of the interpretive communities in which those families lived.

The stories vary widely in their specifics, but some storylines occurred over and over. In what follows, we describe the two most prominent ones, both of which involve threats to girls' sexual respectability. We include excerpts from the interviews to illustrate these themes.

3.2.1. Suicidal Acts in Response to Sexual Accusations

Accusations of a romantic liaison (a "connection" with a boy) or sexual misbehavior figured in many of the stories. Like Vimala and Sunila, whom we described earlier, many girls gave accounts in which accusations of sexual misbehavior triggered the suicide-like act. Anu is one example.

Anu (age 15) was the only girl in her family. She had five brothers. On the way home from school, she said, "A boy came after me and spoke to me. A relation of ours saw it. I got afraid because I knew he would tell my brothers. I rushed home and swallowed ten tablets of Panadol [the local brand of Paracetamol] [. . .] My brother would have scolded me, but he won't scold me now".

Accusations by senior members of the family often involved fierce confrontations and harsh scolding. Not infrequently, girls' stories told of physical assaults by their parents or elder brothers. In their interviews, mothers often unapologetically corroborated their daughter's story. As the stories told by Mallika and Chalini portray, girls' suicidal acts took place in response to these family altercations:

Mallika (age 17) was to meet her mother at the bus stand in a neighboring town and travel home with her. They missed each other, however, and Mallika returned home alone. Her mother arrived home "in a great fury". She surmised that Mallika had surreptitiously met a boy. She physically "assaulted" her daughter, snatched her cell phone, "dashed it on the ground and crumpled it". Thirty minutes later, Mallika swallowed 30 Paracetamol tablets. Mallika said, "I was sad about what my mother did and I didn't think of anything". Reflecting on things some days later, Mallika amplified her story: "Because mother scolded me, I was angry and so I drank Panadol [a common brand of Paracetamol].

Chalini, (age 18) ingested a mixture of kerosene oil and crushed mosquito coils (i.e., coils soaked in mosquito repellent, which are burned in order to repel mosquitoes). Chalini had been forced to leave school to take up a job to support her family after her father's

unexpected death. A girlfriend found her a job in a garment factory. The factory was some distance from Chalini's home, so she arranged to board with the girlfriend's family. Within a few weeks starting the job, however, Chalini's younger brother accused her of having an affair with a boy in the household. Her older brother forcibly dragged her back home. When Chalini disputed the accusation, both brothers, she said, "physically assaulted" her. In response, she swallowed the poison she had concocted. In hospital, Chalini said, "I felt sad and I drank poison".

Other girls, such as Lakshmi, were subjected to taunts by their peers about (alleged) sexual misbehavior. Lakshmi was shamed by what she understood to be a schoolmate's oblique reference to an out-of-wedlock pregnancy. In Lakshmi's eyes, the taunt brought down shame on her and it dishonored her family as well.

Lakshmi (age 16) had returned to school after several days' absence. A girl in her class slyly asked her if she had "gotten married" while she was away. Lakshmi interpreted this remark as implying she had gotten pregnant. She felt sad, she said, and she thought about how sad the girl's remark would make her mother. She bought a card of 10 Paracetamol tablets on the way home from school. When she got home, she swallowed them all. She found another card of Paracetamol tablets at home and swallowed those as well. Then she told her mother what she had done.

To an outsider, the norms of feminine propriety to which unmarried female adolescents must conform seem inordinately stringent. Moreover, in a time when rural families are pushing daughters toward higher education and toward work in the paid labor force, such norms seem unsustainable. What is also striking is the array of community members who take it on themselves to surveil a girl's actions—neighbors who tattle on the basis of slender evidence; peers who taunt her; and brothers (elder and younger) who have license to police her actions and beat her for what they regard as infractions. Among the families in this study, both generational and gendered hierarchies of power seem firmly held in place.

3.2.2. Suicidal Acts as Strategic Efforts to Force a Change in Others

For some girls, a suicide-like act was a desperate attempt to intervene in their father's excessive drinking. In rural Sri Lanka, habitual alcohol misuse is widespread among men [21,22]. Men's drunkenness spawns chronic health problems, spousal violence, economic problems, and strife within families. It often leads to mayhem, street brawls, and trouble with the law. Habitual drunkenness and uncouth behavior by male members bring disgrace to the family and sully the family's good name. As Ramani and Ayesha well understood, a father who was known as a drunkard diminished the prospects of a good marriage for his daughters. Distressed by the implications of their fathers' behavior, they resorted to suicidal acts as a means to impress on them the need for change.

Ramani, age 17, had a father who was a heavy drinker. Often he was found lying on the road, unconscious and unclothed. Ramani reported that she frequently lay awake at night, thinking about "all the things he was doing . . . " Ramani said, "When they behave like that, there will be no future for grown-up girls". [This statement alludes to the likelihood that her father's continual public intoxication would negatively affect the family's chances of arranging a good marriage for herself and her sisters.] Ramani swallowed several Paracetamol tablets.

Ayesha, age 18, swallowed 36 Paracetamol tablets because she was distressed by the public display of her father's drunken shouting, boisterous singing, and uncouth behavior. In the hospital, Ayesha told CS, "I got so wild. I got down the tablets through my younger sister [i.e., she sent her younger sister to purchase them at the local shop.] and took them". . . . "I had in my mind that I will punish him and frighten him . . . not that I wanted to die. I wanted to somehow see that father would not drink thereafter. I decided to put a stop to it today itself. . . . It came to my mind that if I do a thing like this, he will not drink hereafter".

Ayesha's mother concurred with Ayesha's account, adding that Ayesha "felt ashamed when her father was shouting loudly . . . She tells father not to drink because all are girls in the family. She is ashamed of it".

Kanthi's suicide-like act was also undertaken as a means to force another person to stop behavior that was detrimental to her. Kanthi, age 15, had received repeated marriage proposals from a 19-year-old cousin. With the agreement of her family, she had refused these proposals. She was too young to be legally married, and she needed to remain in school. Nor did she like the boy. To coerce her into agreeing to marry him, the boy took an overdose of sleeping pills. From the hospital, he asked his sister to take a letter to Kanthi. In the letter, he threatened to take a lethal dose of poison unless she agreed. "If anything happens to me", the letter said, "my family will ruin your family. They will not be quiet". Kanthi countered his threat by swallowing two packets of a highly toxic bleaching agent. In hospital, she told CS triumphantly, "Now they won't harass my family anymore".

3.3. Families' Responses to Girls' Suicidal Acts

Thus far, we have focused mainly on girls' accounts of their suicidal acts. In those accounts, girls positioned themselves as having temporarily experienced acute feelings of upset, sadness, or anger, telling stories of interpersonal situations that were difficult, painful, or unfair. In most cases, their mothers were not inclined to be sympathetic. Mothers expressed little interest in their daughters' emotional distress. Mothers (along with many hospital nurses and doctors) repeatedly used the phrase "a foolish thing" to berate their daughter for what she had done. They interpreted the suicide-like act as an indication of a lack of proper self-control, of "stubbornness", or of "disobedience". Some daughters described their mother's angry response to their suicidal act. For example, a 15-year-old described her mother this way:

First she beat me. Then she threw me into a 3-wheeler [a three-wheeled taxi] and rushed me to the hospital.

Some mothers viewed their daughter's behavior as a willful lack of consideration for the welfare of other family members. A mother of a 17-year-old girl told CS:

On the way to the hospital, I told her that if she happens to die, both mother and father will have to languish in jail. Your younger sister and younger brother will be on the road where they will have no one.

(This is, of course, an exaggeration. Parents are not jailed because of a child's suicidal act, nor are young children left "on the road" by their families.)

CS did not speak directly to fathers, few of whom visited the hospital. However, mothers often expressed worry regarding the extremity of the reactions of their husbands and older sons. Some mothers noted that their husbands were upset and shamed by their daughter's hospitalization. However, other mothers described their husbands' mood as angry. One mother recounted her husband's response when she told him that their daughter had swallowed an overdose of Paracetamol:

Suddenly father jumped up, asked me the reason why, and shouted at me. Father has become furious. After she was brought to the hospital, he said that she can no longer live with him, having had such a thing in her mind.

A number of mothers said that their husbands and elder sons intended to punish the girl when she returned from the hospital. One mother said:

I know she will be beaten when she gets home. They are in a fury, and I fear their rage.

Another mother said:

Father plans to beat the girl when she gets home. I have to find a way around that.

According to many mothers, fathers and elder brothers assumed that the girl's suicidal act was proof that she had lost her virginity. The plans men entertained for rectifying this were quite extreme. For instance, some fathers and elder brothers, presuming that there had been sexual "connection", were intent on locating the boy and then beating up him and his father. In one instance, a father and his elder son had armed themselves with knives and attacked the boy whom they believed had "defiled" the girl. The police had intervened, and a court case was pending. Other fathers were prepared to force their daughters into a marriage if the girl had been "spoiled". It mattered little if the boy was a "bad character" or his family was "bad" or the girl was too young to be married legally. In many cases,

mothers expressed strong reservations about the wisdom of their husband's plans, and they said they were seeking ways to prevent him from putting them into effect.

In sum, for girls' parents, their daughter's suicide-like act precipitated a crisis. In no case, however, was this seen as a mental health crisis. For mothers, the girl's action was a display of lack of control over her emotions and of willfulness. It was evidence as well of her disregard for protecting the honor and "face" of the family. However, for fathers, the salient meaning of their daughter's suicidal act was the (presumed) violation of her sexual purity; punitive measures were foremost on their mind.

3.4. Suicide-like Behavior and a Spoiled Identity

As mothers and daughters well knew, public knowledge of a girl's suicidal act would damage her reputation and diminish the family's status. Village gossipmongers would spread the word, and people would infer that some kind of sexual misbehavior or sexual defilement had been involved. The young woman would no longer be regarded as a "good girl". Therefore, secrecy was a paramount concern for both mothers and daughters. A mother, for example, said:

It's more important to keep it a secret if it's a girl; we all know how people gossip.

Commenting about another girl's suicidal act, a girl said:

People say various things, and they say that she is not a good girl.

Another girl said:

I will not be able to face others, as the villagers will say this and that.

The mother said this:

Now also no one in the village knows about it, as it can be a problem for her. The villagers come out with other problems. ["Other problems" is likely a euphemism for sexual misbehavior.]

A mother reported that her family was determined to keep the daughter's suicidal act a secret . . . because people are waiting to laugh at us.

Mothers took a variety of steps to shroud a daughter's suicidal act in secrecy. Some fabricated false diagnoses (e.g., a bout of gastritis; an allergic reaction to medication) to explain their daughters' hospitalization. Others took precautions to hide their daughters away from hospital employees who were neighbors. Some entered fictitious addresses in the hospital records. Some mothers thought that they might send their daughter to live with distant relatives until the local rumormongers turned their attention elsewhere. Some mothers intended to confine their daughter at home.

Mothers' concerns about the potential damage of exposing a girl's suicidal act were not unfounded. During follow-up interviews, some girls reported experiences of social exclusion. Some girls had been living in boarding houses or staying with relatives. In every such situation, the girl was not allowed to return. The owner of one boarding house told the girl's mother:

Her coming back here would create a problem for the other girls.

In some cases, the school principal refused to allow girls to return to school. Some girls were barred from private tuition classes they had been enrolled in. In at least one case, the parents of a girl's best friend forbid their daughter from associating with her. In short, mothers' concerns about the social and reputational harm that a girl's suicide-like act would do seemed quite justified. Further, the various forms of social exclusion that girls experienced seemed to coalesce around a concern that the girl was no longer a "nice" (proper and morally upright) girl. Her presence among other girls would be a source of contamination.

4. Conclusions

Every year, high numbers of girls in rural areas of Sri Lanka are admitted to hospital following their ingestion of household poisons or medicinal overdoses. Girls arrange these suicidal acts in ways that strongly suggest that the acts are not intended to cause death. Among the participants we studied, many of such suicidal acts sprung from clashes within

families, often involving girls' sexual respectability. Mothers regarded their daughter's suicidal act as "foolish" and headstrong. It also signified the girl's disregard for her family's status. For young unmarried women, a suicide-like act automatically sparked rumors of sexual impropriety, jeopardizing both the girl's honor and the family's good name.

The meanings, practices, and aftermath of girls' suicidal acts offer a window into the gendered expectations, constraints, and demands placed on young unmarried women. We offer a brief description of boys' suicidal acts to highlight disparities between the girls and boys. First, only about a third as many boys as girls were hospitalized for a suicidal act. Second, among the boys we interviewed, there were no instances in which an accusation of sexual impropriety played a role. Third, boys' suicidal acts usually took place outside the home at school or among their friends. Sometimes the boys were involved in "suicide play" with their friends, for example, "daring" one another to drink poison [23]. Third, no boy spoke of having been "assaulted" by a parent or elder sibling when he disclosed his suicidal act, nor were there reports of a boy being barred from attending school or turned out of his place of residence for fear of "contaminating" other boys. The number of boys we were able to interview was too small to permit further analysis, however, even this cursory discussion suggests that, among adolescents at least, suicidal acts are highly gendered.

In the rural setting of this study, girls' suicide-like acts often arose in the context of family conflicts regarding feminine propriety and sexual respectability. At the same time, suicidal behavior seemed inevitably to arouse societal anxieties about sexual misbehavior or sexual violation. Why do the suicidal acts of girls seem to evoke scolding, punishment, and social exclusion when those of boys do not? Why do families regard concealment of a suicidal act as so crucial for girls? The reasons, we surmise, lie in the negative consequences that such acts may have for both girls and their families. In Sri Lanka, the canonical narrative of suicide attributes it to anger and a desire for vengeance. Such motives stand in sharp contrast to prescriptive norms for girls such as docility, obedience, and *læjja-baya.* Furthermore, girls' suicidal acts—no matter the actual circumstances—seemed inevitably to give rise to speculations about sexual misconduct. As we noted earlier, a "good" marriage (that is, a marriage that betters a family's economic and social status) depends on a girl's good reputation. Public knowledge of a girl's suicidal act may diminish her family's chances for upward social and economic mobility.

We note that social and economic changes wrought by modernization come into conflict with stringent standards of feminine modesty and propriety [24]. Consider Chalini, for instance, whom we described above. The straitened circumstances of Chalini's family required her to leave school and take a job. However, just a few weeks after she began to work, someone floated a rumor about a sexual liaison, which impugned her (and her family's) respectability. Even though Chalini denied the rumor, her brothers forced her to quit her job and return home. Contentious arguments between Chalini and her brothers led to physical fights, and ultimately to her suicidal act. More generally, the present-day circumstances of everyday life for many adolescents no longer permit parents to monitor their daughters' movements and acquaintances. For example, many rural families arrange for their adolescent daughters to pursue schooling beyond what the village school provides. Consequently, many girls ride public buses to schools some distance from home. During these journeys, young people intermingle without parental surveillance. This is just one of many instances in which the degree of surveillance and control that rural parents had over earlier generations of adolescents is no longer possible.

We next consider possible applications of this work. We first note the acute lack of resources for mental health care. Although Sri Lanka is often touted for its free health care, behavioral health care has lagged far behind. Psychiatrists are concentrated in a few large cities; even there, mental health care is accessible mainly to the cosmopolitan elite. The national health system, which serves a population of 22 million, employs only three psychologists. The THK, the third largest tertiary care hospital in the country, serves a catchment area of roughly two and a half million people yet it employs only four psychiatrists and one psychologist.

We remind readers that in Sri Lanka, the canonical narrative of suicide holds suicidal acts to be caused by anger and a desire for revenge, not by mental disorder. This narrative organizes suicidal acts, families' responses to such acts, and the medical care given to suicidal individuals. In the THK, for example, people who have engaged in suicidal acts are admitted to a medical ward, where their physical injuries are treated. When the physical condition permits, the patient is discharged. In the unusual case where there is also evidence of a psychological disorder or a prior history of psychiatric hospitalization, a patient can be transferred to the psychiatric ward.

Some readers may believe that suicidal individuals in Sri Lanka ought to be given the psychiatric diagnoses conventionally given to suicidal individuals in Western countries. We disagree. This, of course, is germane to longstanding debates about the transcultural validity of Western-centric diagnostic categories, a debate that we cannot rehearse here. We note simply that because of the unavailability of psychologically oriented treatments, a patient would derive little benefit from receiving a psychiatric diagnosis. In fact, receiving such a diagnosis likely would be detrimental. There is a lasting stigma associated with being labeled as being *pissu* (crazy) or as having a *manasika rogaya* (disease of the mind). Such labels incur a stigma for both patient and family. It is for this reason that many families shun services offered under the auspices of psychiatry. Instead, they might seek out the services offered by indigenous healers, including astrologers and palmists who offer diagnoses and prognoses, and ritual specialists who can provide curative charms and amulets. In addition, many people engage in spiritual practices such as *Bodhi puja* (ritual worship of the Buddha) or chanting *seth kavi* (auspicious verses).

Our work and that of others underscores that suicidal acts are relational practices that accord with the prevailing social order and the cultural ethos. In rural Sri Lanka, suicide-like acts (and threats of same) are commonplace. "Suicide games" are an everyday element of childhood play [23]. Often, suicide-like acts (and threats of same) are the means by which persons lower in status (e.g., wives vis à vis their husbands; young adults vis à vis their parents) gain leverage over the other's behavior [24]. For example, threatening suicide by feigning a gulp of insecticide is a commonplace way for a wife to try to curtail her drunken husband's violence. The girls we studied told stories about neighbors, relatives, and household members who had engaged in suicidal acts. In their villages, such occurrences were not extraordinary. Moreover, the girls did not criticize those individuals. In fact, some girls viewed such suicidal acts as effective means to force others to change. One of us (JM), working with rural school counselors, noted a similar endorsement of the use of suicidal threats as a useful way to force behavior change [25]. Altering this generalized cultural endorsement of suicidal acts is a significant challenge for anyone interested in suicide prevention.

Finally, in our view, it is important to move away from the conventional focus on presumed deficiencies or pathologies of those who engage in suicidal acts. Ought we to prescribe "anger management" for a wife whose drunken husband threatens her with ax? Does an adolescent whose mother flies into a "towering rage", beats her with a belt, and demolishes her cell phone need better "coping strategies?" Is the girl's anger a symptom of Emotion Dysregulation Disorder? Further, is there any evidence that those who engage in suicidal acts lack "decision-making skills" or "self-esteem?" Whether intended or not, such person-centered attributions blame the victim. In place of speculations about individual deficits and pathologies, we urge attention to the cultural, structural, and relational conditions that set the stage for such suicidal acts. In rural Sri Lanka, for example, wife abuse is commonplace and widely condoned. Chronic drunkenness among men is an unremarkable fact of life, which carries few legal repercussions. Children and adolescents are subjected to shaming and harsh physical punishment both at home and in school. Rigidly enforced generational hierarchies give rise to strained relations among extended family members. Economic precarity fuels family conflicts. Ameliorating the structural and cultural conditions of rural life may be an effective means of curbing the incidence of suicidal acts.

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Article

Studying Scripts of Women, Men and Suicide: Qualitative-Method Development and Findings from Nepal

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Abstract: Information about suicidal behavior in Nepal is limited. According to official records, suicide rates were high until the year 2000 and declined thereafter. Official records are considered unreliable and a gross undercounting of suicide cases, particularly female cases. Suicide research in Nepal has been mostly epidemiologic and hospital-based. Little is known about how suicide is understood by Nepali people in general—including dominant suicide attitudes and beliefs in Nepal. Suicide attitudes and beliefs, which are elements of a culture's suicide scripts, predict actual suicidality. Drawing on suicide-script theory, we developed and used a semi-structured survey to explore Nepali beliefs about female and male suicide. The informants were adult (M_{age} = 28.4) university students (59% male). Female suicide was believed to be a response to the society-sanctioned oppression and abuse that women are subjected to, in their family and community. The prevention of female suicide was viewed as requiring dismantling ideologies, institutions, and customs (e.g., child marriage, dowry) that are oppressive to women, and ensuring that women are protected from violence and have equal social and economic rights and opportunities. Male suicide was believed to be a symptom of societal problems (e.g., unemployment) and of men's psychological problems (e.g., their difficulties in managing emotions). The prevention of male suicide was viewed as requiring both societal (e.g., employment opportunities) and individual remedies (e.g., psychological counseling). This study's findings suggest that a semi-structured survey can be a fruitful method to access the suicide scripts of cultures about which there is limited research.

Keywords: suicide scripts; suicide beliefs; lay theories; women; men; Nepal; qualitative method; suicide causes; suicide prevention

1. Introduction

Information about fatal and nonfatal suicidal behavior in Nepal is limited and of questionable reliability. According to data published by the World Health Organization (WHO) in 2014 and 2021, suicide rates in Nepal have varied widely over time [1,2]. According to the 2014 WHO report, in 2000 and 2012 Nepal had among the highest female mortality by suicide in the world. Age-standardized female suicide rates were estimated at 27.1 per 100,000 in 2000, and 20 per 100,000 in 2012. Age-standardized male suicide rates were 40.5 per 100,000 in 2000, and 30.1 per 100,000 in 2012. Analyses of suicide rates by age group revealed that in 2000 and 2012 female and male suicide rates were similar in the 15–29 and in the 30–49 age groups. By contrast, the female–male gap in suicide rates was large in the 50–69 age group and even larger in the 60 and older age groups. Consistent with the 2014 WHO report, a Nepali government eight-district study found that in 2008–2009 suicide was the leading cause of death among Nepali women of reproductive age across ethnicities [3]. According to the 2021 WHO report, however, suicide rates in Nepal were substantially lower in both women and men in 2019 [2]. At that time, the female age-standardized suicide rate was 2.9 per 100,000 and the male age-standardized suicide rate was 18.6 per 100,000 [2]. With regard to method, a study of police records found that,

during the period between 1980 and 2019, hanging and self-poisoning by pesticide were the most common suicide methods [4].

There are no official estimates of nonfatal suicidal behavior and suicidal ideation rates in Nepal. A school-based study of adolescent students across five regions found that girls were more likely to report suicidal ideation and nonfatal suicidal behavior than boys [5]. An interview study of married women aged 15–24 found that approximately three-quarters had experienced sexual violence within the marriage, with suicidal thoughts being a common response to the violence [6]. A multiple-district study recorded high rates of suicidal ideation among widows, especially during the year following the husband's death [7].

There are indications that rates of fatal and nonfatal suicidal behavior increased during the COVID-19 pandemic, especially among women [8–10].

In Nepal, suicidal behavior, nonfatal and fatal, is to be reported to the police although there is no criminal liability for suicidal behavior. Since 2017, the abetment of suicide has been criminalized in Nepal. The 2017 code was established mostly to prevent husbands and in-laws from driving women to suicide through mental and physical abuse, including unrelenting dowry claims [11–13]. An unintended consequence of the new code is that more suicides likely are reported as accidents, if they are reported at all. There is evidence (e.g., [14]) that suicide is less likely to be reported when it involves women. As a result of these social factors, Nepali official records are a gross undercounting of suicide cases, particularly female cases [15,16]. Nepali records of female suicide may also be inaccurate by way of over-inclusion. It has been noted that the murders of women by family members, for example, because of pregnancy while single or because of dowry greed, may be reported as suicides [17]. In light of all of these reporting issues, rates and patterns of women's and men's suicidality in Nepal must be interpreted with caution.

1.1. Nepali Women's Suicidal Behavior: Who, How, and Why

Research on suicide in Nepal has predominantly been hospital- or police-record-based, and descriptive. Several studies did not separately examine female and male suicide patterns [5,18,19].

The hospital- and police-based descriptive studies that analyzed patterns by sex indicated that Nepali women who are suicidal and/or die of suicide are typically young and married (see [20] for a review). A psychological autopsy study of police cases, with the majority (28 out of 39) of informants being male relatives or friends, found that half of the female decedents had children; and that hanging (61.1%) and poisoning (33.3%) were common suicide methods [21]. Mental disorders were reported to be a factor in female nonfatal and fatal suicidality in one-third of the studies reviewed by Kasaju and colleagues [20]. With regard to causes of female suicide, discrimination, abuse, and a culture mandating female subservience and silence have been considered most relevant. For example, in a review of studies by Marahatta and colleagues [22] female suicide was explained in terms of "social hardship . . . such as poor empowerment of women, lack of educational opportunities . . . cultural norms restricting self-expression, space and choice, . . . [and] child marriage" (p. 46). Experiencing violence from an intimate male partner and having no recourse against it has also been linked to female suicide in Nepal [3].

A qualitative analysis of interviews with mostly male relatives or friends of persons who died of suicide (cases that were identified via police records) generated three narratives of female suicide [23]. One narrative was that the women took their life because of shame after having engaged in a behavior (e.g., "a forbidden love relationship") that "damaged . . . [their] *ijjat* (social status) . . . in the community, devaluing . . . [their] worth and purity . . . . [and] the *ijjat* of the family". In this narrative "[s]hameful situations for women typically placed individual blame or fault directly on her" (p. 719). Another narrative was that the suicide was a response to chronic abuse by the husband or male partner, in-laws, paternal family, and/or community. In many of these cases, alcohol abuse by the husband was an additional stress experienced by the women who took their lives. The informants believed

that the women had been driven to suicide by the fact that, in their community, women have no recourse against the abuse that they suffer. Therefore, these female suicides were framed as indirectly perpetrated homicides. The third narrative was that the women's deaths were covered-up homicides perpetrated by their family. Taken together, the findings of this study indicate that people saw the suicide of their female relative or friend as a response to family- and community-condoned oppression and abuse.

1.2. Nepali Men's Suicidal Behavior: Who, How, and Why

Information about men who are suicidal and/or die of suicide in Nepal, as separate from information about women, is often unavailable in hospital- and police-based descriptive studies (see [14] for a review). A psychological autopsy study [21] that examined police records by sex found that most of the men who died of suicide were married (81%) and had children (76.2%). Hanging (66.7%) and poisoning (23.8%) were these men's most common methods. About one-third of men had been involved in migrant labor. The same study found that on the day of the suicide about half of the men had consumed alcohol. None was reported to have a mental illness at the time of the suicide. In a study by Pradhan and colleagues [3], occupational issues such as unemployment were reported to be relevant to male suicide.

A qualitative analysis of interviews with mostly male relatives or friends of persons who died of suicide generated three narratives of male suicide [23]. One narrative was that the men took their life because of shame. Male shame suicide was connected to "broad situations . . . characterized as being out of the man's immediate control (e.g., crops failing, general situations of poverty)" rather than a specific event (p. 719). A second narrative was that alcohol abuse was to blame for the suicide and its antecedents, including poverty and the deceased man's abusive behavior towards his family. A third narrative was that the suicide was a response to financial problems. This narrative was more common in the case of younger men's suicides. These "[m]en were described as feeling like a failure because of financial burdens or an inability to succeed economically". It was stated that "[t]his sort of failure in males often led to alcohol abuse, perpetuating feeling of shame and damage of one's *ijjat*" (p. 719). Difficulties re-integrating in the family following migrant work was a thread across the three narratives.

1.3. Strengths and Limitations of Past Studies of Female and Male Suicide in Nepal

Hospital and psychological autopsy studies have provided information on patterns and themes of female and male suicide in Nepal in terms of the characteristics of the suicide decedents, and the methods they use, and in terms of possible suicide explanations. In this way, the hospital and psychological autopsy studies have started making visible the scripts of female and male suicide in Nepal.

With regard to suicide explanations, a limitation of hospital studies is that they record the perspectives of professional staff. Professionals' views of suicide are influenced by their training and by the interests and politics of their profession. A limitation of psychological autopsy studies is that the suicide explanations of family and friends are shaped by the relationship the informants had with the deceased and by the emotional and social impact that the suicide had on them.

An important way to access the suicide scripts of a culture is via studies of the suicide beliefs of so-called lay people, that is, people who are not professionally involved with suicide [24–38]. Because suicide is a relatively rare event, most lay persons have not experienced a death by suicide in their close relationships—though someone close to them may have had suicidal thoughts. Studies of lay persons' beliefs about suicide provide a unique window into a culture's scripts of suicide.

1.4. Cultural Scripts of Suicide: Theory and Findings

A culture's suicide scripts include the conditions under which suicidal behavior is relatively acceptable, and even expected in that culture—by whom, with what method,

when, why, and with what consequences [39–42]. A culture's suicide scripts are both descriptive and prescriptive. A diversity of evidence shows that a culture' suicide scripts influence the likelihood of suicidal behavior in that culture [43–47]. For example, a U.S. longitudinal study found that suicide acceptability (an element of suicide scripts) predicted suicide in the general population—by a twofold increase, in some cases [45]. A culture' suicide scripts also influence the form that the suicidal act takes (e.g., the suicide method and the circumstances of the suicide) and the suicidal act's outcome (see [42] for a review).

Research on suicide scripts has used both quantitative (e.g., [30,36,48,49]) and qualitative methods. A qualitative approach is most common and appropriate when there is limited information about the suicide scripts of a culture or social group [24–29,31–34,37,38,50–61]. As argued by Staples and Widger, to understand suicidality, we need to learn "how suicidal behaviours are imagined, talked about, and practiced; how they relate to other kinds of behaviours and other kinds of institutions; when and under what possibilities different people in the communities we study think suicide might arise and when it might not, when it might be 'acceptable' and when it might not; and how suicidal behaviour does not begin with the 'precipitating factor' and end with the 'suicidal act,' but extends deep into individual and collective pasts and futures" [62] (p. 199).

1.5. This Study

In the current study, we developed and used a semi-structured survey to explore female and male suicide scripts in Nepal. Drawing on suicide-script theory [39,40,42] and research [28,29,31,33,36,55,63], we documented views of the "who" (i.e., beliefs about the typical age and civil status of women and men who die of suicide) and "how" of suicide (i.e., beliefs about the methods used by women and men who die of suicide, and why they use those methods), as well as views of warning signs (i.e., behaviors believed to suggest that a woman or a man is considering suicide). In addition, we recorded views of the "why" of suicide (i.e., beliefs about the causes of female suicide versus the causes of male suicide) and the "why not" of suicide (i.e., views about what could prevent female suicide and what could prevent male suicide). Finally, we requested participants to provide a definition of suicide and to give us feedback about the survey.

2. Methods

2.1. Sample

This study's informants were 74 Nepali adults (58% male, M_{age} = 28.4; 51% never married). At the time of data collection, they were graduate students at Trichandra College, an institution which is part of Tribhuvan University, Kathmandu. The participants' main fields of study were Sociology (24%), Rural Development (18%), Psychology (8%) Education (7%), and Management (7%); 18% of participants were in other fields of studies and 19% did not report their field of study. The participants had lived in Kathmandu for a median of nine years.

2.2. Recruitment and Procedure

Recruitment and data collection were structured based on recommendations of Nepali professionals, including a psychology professor and a mental-health therapist. The study was advertised among graduate students in a program that requires English-language fluency. Data collection was conducted in classrooms at Trichandra College. During data collection sessions, a Nepali research assistant read a description of the study and the informed-consent statement and then distributed paper versions of the informed-consent statement. No participation incentives were offered to the respondents. After the participants read and signed the informed consent, they were given access to a paper copy of the survey. Participants had between 20 and 30 min to complete the survey. After they finished, participants were given a written debriefing statement that included information about counseling services that they could access, should they wish to discuss issues and feelings triggered by the survey. Data collection was conducted in 2014.

2.3. Measures

A survey including a combination of Likert-scale and sentence-completion items was used to probe key elements of suicide scripts. The theoretical foundation of the survey is suicide-script theory [39,41,42].

The survey was developed by the study's authors. Each author brought unique expertise to the project. Canetto is a bi-national (Italy/USA) counseling, clinical, social, and lifespan psychology professor at Colorado State University, USA, and a suicide-scripts scholar. Menger-Ogle is a U.S.-born social psychologist who completed his doctorate at Colorado State University. Menger-Ogle spent 6 months in Nepal where he collaborated with a diversity of local professionals on refining this study's method and then collecting this study's data. Subba is a Nepal-born and -educated psychology professor, currently at Trichandra College, Nepal. The study's survey development benefited from feedback from a Nepali mental health therapist and a Nepali research assistant. Prior to being used with this study's sample, the survey was tested with two groups (n = 6; and n = 11) of Nepali university students, and revised based on these students' feedback. The informed consent and survey were in English because the target sample was graduate students in a program that requires English-language proficiency.

There were two versions of the survey. One focused on female suicide and the other on male suicide. Thirty-six informants (61% male) responded to questions about female suicide and thirty-eight (55% male) responded to questions about male suicide.

The first set of survey items asked respondents to indicate how knowledgeable they were about suicide in Nepal (on a scale of 1–5), how they had learned about suicide in Nepal (based on 5 options); and how big of a problem they thought suicide is in Nepal (on a scale of 1–5). The respondents were also asked to indicate whether suicide is more of a problem for women than for men, vice versa, or equally for women and for men.

The next set of questions requested that participants indicate what they thought are the typical age and marital status of women (or men) who kill themselves, and what the participants believed are women's (or men's) typical suicide methods and the reasons for the chosen methods.

Participants were then asked to describe a common warning sign of suicide in Nepali women or a common warning sign of suicide in Nepali men.

Following that, participants were asked to indicate why Nepali women (or Nepali men) kill themselves and what could prevent women's (or men's) suicide.

The last section of the survey requested feedback about the survey (i.e., clarity of the survey on a 1–5 scale; items that participants found difficult to understand and why, and recommendations about questions to be included in future studies of suicide in Nepal). The final survey question asked for a definition of suicide (see the Appendix A for the full text of the suicide-script survey).

2.4. Data Analyses

Braun and Clarke's [64] thematic-analysis method was used to code and organize into themes the responses to the sentence-completion questions. A multi-national research team led by Menger-Ogle processed the suicide-scripts data. Menger-Ogle and four research assistants (a Bangladeshi woman, a Romanian woman, a U.S. woman, and a U.S. man) coded the responses. Canetto and Subba served as consultants to the data analysis. A semantic approach was taken to the sentence-completion responses. Team members familiarized themselves with the data, generated initial codes, searched for patterns within the explicit meaning of the data, reviewed the patterns, and then defined and named the themes represented by the patterns. The process through these phases was iterative, not linear. Toward the end of the data-analyses process, quotes were chosen to provide examples of the themes. Information about specific topics (e.g., suicide prevention) was not necessarily or only given in response to those topics' questions (e.g., the questions on prevention). Therefore, coding for specific content drew across the full data set. Responses

regarding feedback about the survey and the suicide-definition data were processed by the study's authors.

3. Results

3.1. General Views of Suicide in Nepal

3.1.1. Quantity and Quality of the Data

There were 210 responses to the sentence-completion items about female suicide; 189 were comprehensible and usable. Of the 228 responses to the sentence-completion items about male suicide, 216 were usable.

Participants rated the survey as moderately clear (M = 3.4, SD = 1.0, for the female survey; M = 3.6, SD = 1.2, for the male survey). The item that participants found most difficult to understand was the question about warning signs of suicide.

3.1.2. Participant's Views of Their Knowledge about Suicide in Nepal

The respondents believed that they had adequate knowledge about suicide (M = 2.8, SD = 1.0, for the female version of the survey; M = 2.9, SD = 1.0, for the male version). Most reported having learned about suicide because suicide had happened in their community (29% in the female version of the survey; 38% in the male version); or via media stories (39% in the female version of the survey; 35% in the male version). No participant learned about suicide through a job that dealt with suicide.

3.1.3. How Big of a Problem Is Suicide in Nepal?

Participants who responded to the questions about female suicide believed that suicide is a moderately serious (M = 3.2, SD = 1.2) problem in Nepal. The participants who expressed views about male suicide also believed that suicide is a moderately serious (M = 3.6, SD = 1.2) problem in Nepal.

3.1.4. Who Do You Think Suicide Is Mostly a Problem for in Nepal?

Most (66%) respondents reported a belief that suicide is mostly a problem for women or a problem for women and men equally (30%). Only four percent believed that suicide is mostly a problem for men in Nepal.

3.1.5. How Do You Define Suicide?

In response to this question, respondents provided a description of suicide (e.g., *killing oneself* and *the act of intentionally causing one's death* wrote a female and a male respondent, respectively). Respondents also wrote about the social (*the society and state are responsible* wrote a male participant) and/or the psychological problems (*to get rid . . . from the pain of living* stated a male participant) that they believed trigger suicide, and how these social and psychological problems may be linked (*negative thinking . . . cause* [sic] *by social cultural and economical disorder of Nepalese society toward women* wrote a male respondent). There were comments about suicide as a foolish person's act (*person seem* [sic] *to be foolish* wrote a male respondent), an illness (*disease* wrote a female respondent), a mental disorder (*a mental disorder which forces one to kill himself* wrote a female respondent) or a way to achieve a new soul (*a person thinks this world is full of sin and troubles and wants to be free from his soul to achieve a new one* stated a male participant).

3.2. Views of Female Suicide

3.2.1. What Kind of Nepali Woman Is Mostly Likely to Suicide?

Most participants (76%) believed that women who die of suicide typically are ages 20 to 24. Half of participants expressed the view that suicide is more common among married women and the other half thought that it is more common among single women.

3.2.2. Using What Method, Typically, and Why?

The respondents believed that common suicide methods used by women are hanging (78%) and poisoning (73%). Examples of poisoning included medication and pesticides. Other methods mentioned as typical among women were drowning, burning, and jumping from a height. The respondents expressed the view that women use these methods because they are widely available, easy to execute, effective, and discrete.

3.2.3. What Are Warning Signs of Suicide for Nepali Women?

The respondents believed that warning signs of suicide for Nepali women are isolating oneself (*stays alone* wrote a female respondent) and negative emotions (*frustration, irritation, anger* said a female respondent; *depression and stress* and *depression due to love and social problems* said two male respondents, respectively). Having family problems (*suffering from violence* wrote a female respondent) was also mentioned as a warning sign of female suicide.

3.2.4. Why Do Nepali Women Kill Themselves?

Statements about the perceived causes of female suicide in Nepal were classified into three categories: individual, interpersonal, and societal.

Female suicide was linked to negative emotions (*they are in frustration* wrote a female respondent; *depression* stated several male respondents; *when they are highly discouraged, frustrated, when they face the embarrassing moment . . .* [that] *they couldn't tolerate* wrote a male respondent) and negative thinking (*helpless* stated a female respondent; *They think they have no way to go forward* wrote a female respondent).

Female suicide was also associated with interpersonal problems. When the interpersonal problems were named, they were described as physical and mental abuse and oppression perpetrated by family members, usually after marriage *(physical and mental violence* stated a female respondent; *regular repetition of domination (physically and mentally) done to them* stated a male respondent). Disappointment and failure in love relationships were also presumed causes of female suicide (*if they have a failure* [in] *their love especially teenagers* wrote a female respondent; *break up in their love* and *they fail in love and or their marriage fails* wrote two male respondents, respectively).

Finally, the societal causes of female suicide were thought to be the oppression and discrimination that women experience in their community and the oppression, abuse, and violence that women are subjected to in their family (all without a possibility for recourse), combined with the inadequate economic resources and the limited work and life opportunities that women have in Nepal (s*ocial abuse* wrote a male respondent; s*ocial structure, norms and values, discrimination* wrote a female respondent*; harassment, domination, poverty* wrote a male respondent; *unemployment* stated another male respondent). The dowry system (*dowry system* and *pressure for dowry* wrote two female respondents, respectively) was also mentioned a societal factor in women's suicide.

3.2.5. What Could Prevent Nepali Women's Suicide?

Suicide-prevention ideas were classified into three categories: individual, interpersonal, and societal.

At the individual level, respondents thought that female suicide could be prevented if women had more psychological resources, including a stronger sense of their value and importance (*feel about their importance in family, society and country* wrote a female respondent). Participants also believed that the prevention of female suicide requires that women develop their coping skills and psychological stamina so they can better sustain the challenges of the fight for social and economic rights (*learn about different skills and get good psychological counseling* wrote a female respondent; *awareness on rights* said another female respondent).

Family and friends were believed to have a role in reducing female suicide. Respondents said that family members should stop abusing their female relatives (*not involving them in the physical harassments* wrote a male respondent). Respondents also noted as criti-

cal that families be educated about the discrimination and abuse that women experience in Nepali society. Emotional support, love, appreciation, respect, and affirmation were mentioned as family's and friends' necessary contributions to the prevention of female suicide (*give proper support and encourage them* and *give value to their wants* wrote two male respondents, respectively).

In terms of societal suicide-prevention initiatives, female suicide was believed to be preventable via ending the discrimination, oppression, and abuse that women experience in the family and in society (*end of male domination, elimination of social discrimination,* and *empower women politically, economically, socially and treat them equally* wrote three male respondents, respectively; *freedom* and *empowered* wrote two female respondents, respectively). Ensuring that women have social, educational, employment, and economic opportunities equal to those of men was also listed as a societal responsibility in the prevention of female suicide (*equal opportunity* wrote a female respondent, and *be economically independent and well educated* wrote a male respondent). The government was viewed as having a role in providing education about the role that the abuse of women's rights has in female suicide (*bringing awareness about the rights of women* wrote a male respondent). Enacting laws to punish male domination and male violence against women was also recommended as a societal measure to prevent female suicide (*make strict law for the family member who use to dominate their female member* and *could implement strict laws for crimes like rape, violence* wrote two male respondents, respectively).

3.3. Views of Men's Suicide

3.3.1. What Kind of Nepali Man Is Mostly Likely to Suicide?

Most participants (61%) thought that men who die of suicide typically are ages 20 to 24. About half (45%) endorsed the idea that suicide is more common among married men and about half (45%) thought that suicide is more common among single men.

3.3.2. Using What Typical Method and Why?

The respondents believed that the suicide methods typically used by men are hanging (71%) and poisoning (61%). Other methods thought to be common among men were drowning, burning, and jumping from a height. The respondents expressed the belief that men use these methods because they are widely available, easy to execute, effective, and discrete.

3.3.3. What Are Warning Signs of Suicide for Nepali Men?

The respondents believed that warning signs of suicide for Nepali men are isolating oneself (*stay alone, not talking to anyone* said a female respondent), withdrawing from responsibilities *(ignoring family & work* said a female respondent) and negative emotions (*anger, sad,* wrote two male respondents; *frustration, depression* wrote several female respondents).

3.3.4. Why Do Nepali Men Kill Themselves?

Statements about the perceived causes of male suicide in Nepal were classified into three categories: individual, interpersonal, and societal.

Male suicide was associated with negative emotions (*they are frustrated* said several female and male respondents; *depression due to family problems, pressure of education by the family, love affairs* wrote a female respondent), negative thinking (*they feel they cannot solve that problems* [sic] wrote a male respondent) and reduced psychological stamina *(less capacity of bearing problems* wrote a male respondent; *they cannot control their emotion* wrote another male respondent). Failures (*unsuccess* said two female respondents; *failure in their love* said a male respondent; *fail in exams or fail in love affairs* said a female respondent) were also mentioned as individual causes of male suicide.

Male suicide was also linked to interpersonal problems. When these problems were named, they were described as family problems (*family problems* and *home problems and misunderstanding* wrote two male respondents, respectively; *feels neglected by his family or by*

friends wrote a male respondent). Problems in love relationships (*failure in their love* stated a male respondent) were also presumed causes of male suicide.

Socioeconomic problems, including lack of education, lack of jobs or poorly paid jobs, poverty, and economic crises, were mentioned as societal causes of male suicide *(economic crisis, low income* and *their economical* [sic] *base is very crisisful* [sic] stated two male respondents, respectively; *unemployment* wrote a female respondent; it is because *they don't support family and society* wrote another female respondent).

3.3.5. What Could Prevent Nepali Men's Suicide?

Suicide-prevention ideas were classified into three categories: individual, interpersonal, and societal.

At the individual level, respondents thought that male suicide could be prevented if men changed their behavior (*share their feelings openly* and *control their sentiments* wrote a female and a male respondent, respectively). Participants also believed that the prevention of male suicide requires that men have psychological support, including via access to psychological counseling (*psychological treatment and good counseling* wrote a female respondent; *counseling for promoting self actualization enhancing esteem* wrote a male respondent). Education about suicide (*awareness program, increase in education* wrote a male respondent; *information through media*, wrote a female respondent) was mentioned as another individual-focused way for the prevention of male suicide

Family and friends were believed to have a role in reducing male suicide. Family's and friends' emotional support, understanding, care, love, and respect were viewed as critical to the prevention of male suicide (*proper care and love* and *could understand their problem and support them* wrote two female respondents, respectively; *help them in a good way* wrote a male respondent).

In terms of societal suicide-prevention initiatives, male suicide was believed to be preventable by increasing men's employment opportunities (*employment* wrote a male respondent; *opportunities to work with a good salary to complete family needs* wrote a female respondent; *get job in Nepal* wrote a male respondent). The government was seen as having a role in increasing men's awareness and education about suicide (*give information through media* and *do awareness campaign* [sic] *in village/city* said two female respondents, respectively; *topic in lesson at college curriculum, give education about the value of life, promote psychological counseling*, and *classes about psychological counseling in primary . . . school* wrote four male respondents, respectively. It was also suggested that the government enact laws against suicide (*make a strict law against suicide* wrote a female respondent).

4. Discussion

This article describes the method that we developed and used to explore beliefs about female and male suicide among Nepali adults, as well as the findings generated using our method. Via our semi-structured survey, we accessed the views of adults in post-graduate programs regarding who is most at risk of suicide in Nepal. We also examined their beliefs about the methods women and men typically use and why; their beliefs about the warning signs of suicide, in women and in men; and their beliefs about what causes and what could prevent women's and men's suicide.

4.1. Scripts of Female Suicide

A key finding of this study is that female suicide was viewed as having societal causes and as requiring societal remedies.

Specifically, female suicide was considered a response to the society-sanctioned discrimination, oppression, and abuse that Nepali women are subjected to, in their family and community. The narrative that emerged was that women resort to suicide because they have no recourse against the society-sanctioned discrimination, oppression, and abuse. Negative emotions and thoughts, including frustration, depression, and helplessness, were

viewed as an understandable response to such discrimination, oppression, and abuse—not as independent drivers of female suicide

Female suicide was believed to require societal solutions—in fact, a social transformation. Specifically, the prevention of female suicide was viewed as necessitating the end of the discrimination, oppression, and abuse that women are subjected to, at the societal and at the family level; and ensuring that women have social, educational, and economic opportunities equal to those of men.

The beliefs about female suicide expressed by this study's respondents, that the determinants of female suicide are first and foremost societal, are consistent with the beliefs about female suicide that emerged in a psychological autopsy study of Nepali individuals who lost a relative or friend to suicide [21,23]. The role of social and economic factors in Nepali women's suicide was also highlighted in a scoping review of mostly hospital-based studies [20]. The authors of the review stated that "patriarchy, gender inequity, poverty and rigid socio-cultural norms" are the "root causes" of female suicide in Nepal (p. 10). Also consistent across Nepali studies is the view that the psychological problems that suicidal women experience are a response to the discrimination, oppression, and abuse that women are subjected to—not primary and independent drivers of suicide.

Taken together, the social-context-focused explanations of female suicide that recur in this and in other Nepali studies [6,7,14,15,18,19,21] stand in contrast to the female suicide explanations that are dominant in the literature produced in high-income countries [37,40]. In high-income countries, suicide in general, and female suicide in particular, tend to be understood as psychological problems, and specifically, as a symptom of mental disorders, both by the general public (e.g., in Norway [54]) and by researchers (see [65] for a review of high-income-country studies of suicide and mental illness). The kind of mental disorders that, in high-income countries, are assumed to be primary and independent drivers of women's suicidal behavior are mood disorders and borderline personality disorder (see [39,66] for critiques of psychiatric explanations of women's suicidality).

A likely reason for the difference in theories of female suicide by country and by country's income level is that female suicide truly has different determinants in Nepal, and more generally, in low-income countries as compared to high-income countries. This is a plausible explanation given the evidence that the same behavior, including women's suicidality, often has different drivers and different meanings (that is, follows a different script) in different cultures and countries [66,67].

The emphasis in high-income countries on mental illness as the primary driver of suicide, particularly in the case of women, also reflects a theoretical tradition. There are indications that high-income countries' tradition of viewing female suicide as a symptom of women's psychological deficiencies and mental disorders [63] has persisted beyond its empirical justification. Studies show that social and economic factors are important to the suicidality of women living in high-income countries [68].

4.2. Scripts of Male Suicide

A key finding of this study is that male suicide was viewed as having social and psychological causes, with both social and psychological remedies therefore being necessary for prevention.

Societal factors were believed to contribute to Nepali men's suicide. Unemployment or poor employment (including migrant work) were considered especially important factors in male suicide. Consistent with this narrative, expanding men's job opportunities was thought to be critical to the prevention of male suicide. Problems in close relationships, including problems in love relationships, were also viewed as relevant to male suicide.

Psychological factors were also believed to be significant in male suicide. Men who die of suicide were thought to have reduced psychological stamina and problems at managing their emotions. Recommendations for the prevention of male suicide emphasized the importance for men of having psychological counseling.

The beliefs about male suicide that were expressed by this study's respondents, that the drivers of male suicide are both societal and psychological, are similar to the beliefs about male suicide that were expressed by individuals who lost a relative or friend to suicide, in a psychological autopsy study [23]. A difference is that, in the psychological autopsy study, the informants also thought that alcohol abuse had a major role in their male relative or friend's suicide.

Taken together, the explanations of male suicide that recur in this and in other Nepali studies [2,21] are in some ways similar to, and in many ways different from, the explanations that are dominant in the literature produced in high-income countries [37,40]. Across low-, middle-, and high-income-country studies, male suicide is assumed to be driven by adversities in public domains, particularly employment adversities. A difference is that in Nepal, male suicide is also associated with close-relationship, love, and family problems. Another difference is that, in Nepal, male suicide is understood as an expression of men's psychological problems, including their difficulties in managing emotions. Consistent with this view, recommendations for the prevention of male suicide include that men learn about and access counseling to improve their psychological skills.

A likely reason for the difference in theories of male suicide by country and by country's income level is that male suicide truly has different determinants and different meanings (and follows a different script) in Nepal, and possibly in low-income countries, as compared to high-income countries.

The reluctance in high-income countries to consider psychological and close-relationship factors in male suicide also reflects a theoretical tradition. There are indications that the high-income countries' tradition of viewing male suicide as mostly or exclusively a symptom of their public-life problems (e.g., unemployment) has endured beyond its empirical support. Studies show that men's private-life behaviors (including men's participation in family caregiving [69]) and men's psychological problems (e.g., [70]) are relevant to the suicidality of men living in high-income countries.

4.3. This Study's Limitations and Strengths, and Directions for Future Research

As a study about a sensitive and complex topic, and the first study of the suicide scripts of Nepali lay persons, this study was cautious in its method, including the kind of people approached for participation and the data-collection setting. By design, the sample were adults in graduate school in Nepal's capital city. Our reasoning was that educated and urban-living participants would be more comfortable responding to direct psychological questions about suicide. Feasibility also influenced our sample choice. This study's method choices are not unusual. Studies of lay theories of suicide conducted in other countries also had university-student samples (e.g., [29–31,36,55,71]).

We are aware that what made the participants relatively easy to recruit and work with is also a limitation of our study, in terms of the generalizability of the results. In this sense, the contribution of this study is more in terms of method development (e.g., creating and testing a suicide-script survey) than in terms of the study's findings.

This study's survey had mostly open-ended questions, consistent with the method used, for example, in studies by Fortune and colleagues [28] and Heled and Read [29]. By asking respondents to describe their suicide beliefs in their own words, this study facilitated the emergence of ideas that were not anticipated by the researchers, thereby reducing the influence of the researchers' theoretical frameworks. Furthermore, the written format of this study's survey supported anonymity. At the same time, the open-ended, written format of the survey allowed for variability in the length and quality of the responses. To improve the quality of the data, future research using this study's method could include a brief follow-up individual interview or a focus group, as a way to verify the meanings of the written responses and to help clarify how the response to one question may relate to the response to another question.

Future directions for suicide-scripts research in Nepal include translating this study's survey into Nepali languages and administering it to informants representing a diversity

of backgrounds (e.g., level and type of education) and locations (e.g., rural and urban). Expanding beyond a highly educated sample would require substantial adjustments of the recruitment and data-collection procedures used in this study (see [72] for reflections on, and recommendations for, qualitative research in a low-income country).

A limitation of this study is that its sample was majority-male. This is not surprising given that this study's participants were master's program students. In Nepal, the majority of master's students are male [73]. Hageman and colleagues' psychological autopsy studies also had a preponderance of men (72%) among the informants—which the authors explained as the result of men in Nepal being "the public gatekeepers for the family" [23] (p. 711). Given the importance of having a female perspective, particularly in Nepal, where women are expected to be silent [15], future studies of suicide in Nepal should seek to overcome the barriers to women's participation in research and ensure that at least half of the informants are women.

5. Conclusions

Drawing on suicide-script theory, in this study we developed and used a semi-structured survey to explore beliefs about female and male suicide in Nepal. We found that female suicide was thought to be a response to the society-sanctioned discrimination, oppression, and abuse that women are subjected to, in their family and community. The prevention of female suicide was viewed as requiring dismantling the ideologies, institutions, and customs that are oppressive to women and that violate women's rights, including the right to be free from violence; and ensuring that women have equal social and economic rights and opportunities. Male suicide was believed to be a symptom of societal problems (e.g., unemployment) and of men's psychological problems. The prevention of male suicide was viewed as requiring both societal (e.g., improved employment opportunities) and individual (e.g., psychological counseling) remedies. The scripts of female and male suicide that emerged from this and other Nepali studies are more different from than similar to the suicide scripts of female and male suicide of high-income, Anglophone countries.

A conclusion, based on this study's method-development experience and outcomes, is that a semi-structured written survey can be a fruitful way to access the suicide scripts of cultures and social groups about whom there is limited research. A conclusion based on this study's survey findings is that high-income countries' suicide theories and suicide-prevention practices may not be relevant, or may only be partially relevant, in low- and middle-income countries.

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Informed Consent Statement: Participants were provided with oral and written descriptions of the study. Written consent was obtained from every participant.

Data Availability Statement: In order to protect the privacy of the research participants, the responses to the survey cannot be made available.

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Appendix A

Views of Women and Suicide in Nepal

In this survey we ask for your views and perceptions of suicide in Nepal. We are interested in what you have heard about suicide in Nepal. This is NOT a test of your knowledge, so there are no right or wrong answers.

1. **How knowledgeable are you about suicide in Nepal?** (circle a number)

   NOT AT ALL KNOWLEDGEABLE 1 | 2 | 3 | 4 | 5 VERY KNOWLEDGEABLE

2. **How have you learned about suicide in Nepal?** (circle all that apply)
   - ○ It has happened in my community
   - ○ I work in a job that deals with suicide
   - ○ It was a topic covered in presentations in my school/university
   - ○ Via news reporting in the media (newspapers, radio, TV, etc.)
   - ○ Via fiction stories in the media (cinema, TV, books, etc.)

3. **Based on what you have heard, how big of a problem do you think suicide is in Nepal?** (circle a number)

   A VERY SMALL PROBLEM 1 | 2 | 3 | 4 | 5 | A VERY BIG PROBLEM

4. **Based on what you have heard, who do you think suicide is mostly a problem for, in Nepal?** (circle one)

   Women | Men | Equally so for women and men

Please complete the following sentences about at what age, how (via what method) andwhy women typically die of suicide in Nepal.

5. Based on what I have heard, when Nepali women kill themselves, they typically are around the age of _____.

6. Based on what I have heard, when Nepali women kill themselves, they are usually (circle one)

   single/never married | married | divorced | widowed

7. Based on what I have heard, when Nepali women kill themselves, they typically use a suicide method such as _____.

8. Based on what I have heard, Nepali women typically use the above-mentioned method(s) because _____.

9. Based on what I have heard, it is possible to know that a Nepali woman is thinking about killing herself if she_____.

10. Based on what I have heard, when Nepali women kill themselves, it is usually because _____.

11. Based on what I have heard, a common warning sign of suicide in Nepali women (for example, a behavior suggesting that she is considering killing herself) is _____.

Please complete the following sentences about suicide prevention.

12. Suicide among Nepali women could be prevented if women could _____.

13. Suicide among Nepali women could also be prevented if their family _____.

14. Suicide among Nepali women could be further prevented if the government _____

15. Ultimately, the most important step in preventing suicide among Nepali women is _____.

In this section we ask for feedback about this survey so we can improve it.

16. How clear (understandable) is this survey? (circle a number)

NOT AT ALL CLEAR 1 | 2 | 3 | 4 | 5 VERY CLEAR

17. The item or items that are difficult to understand in this survey are items number _____. These items are difficult to understand because _____ _____.

18. What additional questions do you think should be asked to better understand suicide in Nepal, specifically women's suicide in Nepal? _____.

19. Finally, please provide your definition of suicide: Suicide is _____.

Note: The male version of the survey was identical to the female version, save for replacing the word "women" with the word "men" in items 5–18.

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Article

Fatigue on Waking, Insomnia, and Workplace Relationship Problems May Help to Detect Suicidal Ideation among New Middle-Aged Primary Care Patients: A 6-Month Prospective Study in Japan

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Abstract: Signs of suicidal depression often go undetected in primary care settings. This study explored predictive factors for depression with suicidal ideation (DSI) among middle-aged primary care patients at 6 months after an initial clinic visit. New patients aged 35–64 years were recruited from internal medicine clinics in Japan. Baseline characteristics were elicited using self-administered and physician questionnaires. DSI was evaluated using the Zung Self-Rating Depression Scale and the Profile of Mood States at enrollment and 6 months later. Multiple logistic regression analysis was conducted to calculate adjusted odds ratios for DSI. Sensitivity, specificity, and likelihood ratios for associated factors were calculated. Among 387 patients, 13 (3.4%) were assessed as having DSI at 6 months. Adjusted for sex, age, and related factors, significant odds ratios for DSI were observed for "fatigue on waking ≥1/month" (7.90, 95% confidence intervals: 1.06–58.7), "fatigue on waking ≥1/week" (6.79, 1.02–45.1), "poor sleep status" (8.19, 1.05–63.8), and "relationship problems in the workplace" (4.24, 1.00–17.9). Fatigue on waking, sleep status, and workplace relationship problems may help predict DSI in primary care. Because the sample size in this investigation was small, further studies with larger samples are needed to confirm our findings.

Keywords: diagnosis; epidemiology; fatigue; insomnia; internal medicine; suicide prevention campaign

1. Introduction

Most suicidal patients go undiagnosed. Diagnosing suicidal patients' mental health problems in a busy clinical practice with a short consultation period is challenging. The mean duration of visits to primary care physicians was reported to be 16.3 min in the United States [1,2]. Approximately 85% of medical consultations were reported to be less than 20 min in Japan [3,4]. If individuals at high risk of suicide can be identified by asking simple questions, physicians may be able to manage a patient's prognosis more effectively, particularly through treatment or referral. If physicians fail to control patients' high-risk conditions, they may refer them to mental health specialists before imminent risk of suicide. For patients who are at high risk of suicide but have no complaints about mental instability, the procedure of detecting and referring is frequently difficult until the patient

is in imminent danger of suicide. Before developing evident suicidal thoughts, physicians should know more about each patient's suicide risk condition.

According to epidemiological studies of the general population, the 1-year prevalence of suicidal ideation among adults in the United States ranges from 2.3% to 5.6% [5,6]. Suicidal patients are likely to visit primary care clinics before suicide occurs [7]. According to one study, 45% and 77% of suicide patients visited a primary care clinic 1 month and 1 year before suicide, respectively [8]. However, primary care doctors have difficulty identifying their patients' suicidal ideation [9–13]. In one study, reviewing inpatients' clinical charts revealed that 78% of suicide victims denied having suicidal thoughts and intent in their last communication before suicide [14].

Four major components of primary care suicide interventions—namely, educating practitioners, screening for suicide risk and/or mood disturbance, managing depression symptoms, and assessing and managing suicide risk—were reported [15].

Regarding the first component, educating practitioners, educational programs alone are insufficient for preventing suicide [16,17]. With regard to the second component, screening for suicide risk and/or mood disturbance, it can be difficult to conduct routine screening for suicidal ideation, which includes items such as hopelessness, thoughts of killing oneself, and suicide attempts in patients who seek care primarily for physical concerns, particularly at the time of initial medical consultation [18].

Regarding the third component, managing depression symptoms, recognizing depression and beginning treatment are crucial. However, in situations of primary care, depression is frequently overlooked. One meta-analysis found that the prevalence of depression in primary care was 19.5%, but almost half of depressive patients were not identified in primary care [19]. Thus, we previously reported the importance of asking about insomnia at initial medical consultations in primary care because very high specificity and sensitivity were observed for depression in combinations of insomniac subtypes [20].

As for the fourth component, assessing and managing suicide risk, assessing for the presence of suicide risk factors and managing suicide risk may help to prevent suicide. Suicidal behavior is rare in the absence of current symptoms of major psychiatric disorders [21]. Depression has been reported in 50% to 87% of completed suicides [22]. Approximately 60% of depressed patients experienced suicidal ideation during their current depressive episode [23,24]. The relative risks for suicidal attempts during depressive episodes were 7.54 to 33.5 [25,26]. Insomnia has been reported as one of the risk factors of suicidal behavior and is a treatable condition [21]. However, insomnia and the extent of risk of suicidal ideation in primary care settings has not been thoroughly investigated. The association between insomnia and suicidal ideation has been reported among psychiatric patients [27], community residents, the general population [28], patients who died by suicide [29], and other specific populations (e.g., the veteran population) [30]. Few studies conducted among non-psychiatric outpatients have reported an association between insomnia and suicidal ideation [31,32]. Moreover, these investigations were cross-sectional and did not include middle-aged patients at primary care clinics in the community [31,32].

A PubMed search using the keywords "morning fatigue and suicide", "fatigue on waking and suicide", and "morning drowsy and suicide" found no articles. School non-attendance due to difficulty waking up is increasing in Japan [33]. Some studies have investigated difficulties in waking up; however, we found no research investigating fatigue on waking. Furthermore, to the best of our knowledge, no studies have investigated the association between fatigue on waking and suicidal ideation. This proposed association developed from clinical observation. According to Nakai, to prevent suicide in depressed patients, it is important to address their discomfort at waking up in the morning [34]. Thus, the association between fatigue on waking and depression with suicidal ideation (DSI) was investigated in this study.

Inoue et al., conducted an investigation among 17,390 males and 2933 females employed at nine Japanese factories [35]. They reported that males who had high and moderate interpersonal conflict showed significantly higher adjusted odds ratios for depression than

those who had low interpersonal conflict (OR = 2.00–4.88). In Japan, the number of suicides among men, middle-aged people, and employees is high [36–39]; therefore, relationship problems in the workplace are thought to be worth investigating as a potential factor associated with DSI.

In an initial medical consultation and/or in time-constrained circumstances, simple inquiries about issues such as insomnia, fatigue on waking, and relationship problems in the workplace are not difficult to ask about before moving on to more in-depth discussions about suicide and depression. To the best of our knowledge, the associations between the patient's condition, including insomnia, at the initial medical consultation and the new onset of DSI several months after the initial medical consultation have not been investigated. The present prospective study was conducted to address this issue. New patients aged 35–64 years attending primary care clinics were followed for 6 months. If physicians are able to identify a patient's risk of DSI, early diagnosis, treatment, and/or referral may be offered. Otherwise, patients at imminent risk of suicide might not be accepted immediately because of inaccessibility of psychiatrists [40] or patients' anosodiaphoria [41,42].

From 1998 to 2011, more than 30,000 people died by suicide in Japan. To address this, in 2006, the Basic Law on Suicide Countermeasures was enacted. Since that year, a suicide prevention campaign, the Fuji Model Project, has been carried out in Shizuoka Prefecture with the aim of reducing the high suicide rate among middle-aged males [43].

A structure of collaboration between primary care practices and psychiatric clinics (hospitals) was formed during the campaign. In Shizuoka Prefecture, general public education is also carried out. The campaign contains messages about insomnia such as "Dad, are you getting enough sleep?", "Talk with your primary care physician" and "Sleeplessness lasting more than 2 weeks is a sign of depression" that were broadcast on TV. Leaflets containing these phrases were distributed through pharmacies, alcohol shops, and local government-related institutions. The campaign was expanded and conducted nationwide.

The number of suicides in Japan in 2021 was 21,007 [39]. In the general population, 22.9 suicides per 100,000 people were reported. The suicide rates among men and women were 16.8 and 11.0 per 100,000 people, respectively. Suicides among men numbered 13,939, which is 66.4% of total suicides. Suicide rates according to age group were 3618 (17.2%) for the 50–59 years group, 3575 (17.0%) for the 40–49 years group, 3009 (14.3%) for the 70–79 years group, and 2637 (12.6%) for the 60–69 years group. According to occupation, suicide rates were 11,639 (55.4%) for the unemployed, 6692 (31.9%) for employees, 1298 (6.2%) for self-employed or family workers, and 1031 (4.9%) for students and others. Prior to the COVID-19 outbreak up until 2021, the number of suicides per 100,000 in the population significantly increased among females and people aged 10–19 years and 20–29 years of age [36–38]. The suicide rates in 2018, 2019, 2020, and 2021 were 10.1, 9.4, 10.9, and 11.0 for females, 5.0, 5.3, 5.9, and 7.0 for people aged 10–19 years, and 17.7, 17.1, 16.8, and 19.8 for people aged 20–29 years, respectively. The number of female suicides increased from 6550 in 2018, 6091 in 2019, 7026 in 2020 to 7068 in 2021. Therefore, the actual numbers of suicides in Japan are higher among men, middle-aged people, unemployed people, and employed people.

The Basic Law on Suicide Countermeasures calls for early identification of suicidal individuals in medical facilities as well as the collaboration of doctors specializing in physical and mental health. This regulation mandated that all physicians should detect suicidal ideation in patients and refer them to the appropriate mental health institutions.

This investigation was conducted to evaluate the concept of the Fuji Model Project, which could potentially be carried out in any country, regardless of its level of economic development. Additionally, the general public and non-medical professionals can aid in the prevention of suicide. The findings of the current study may assist doctors in identifying patients who are at risk for suicide and treating the condition before it becomes serious, especially in a time-constrained busy professional practice setting.

2. Materials and Methods

2.1. Study Subjects

Subjects were new patients aged 35–64 years, recruited from three internal medicine clinics in Fuji, Shizuoka Prefecture, Japan, from 10 May 2011 to 24 May 2012. The definition of a new patient was someone visiting a clinic for the first time or who had not visited the clinic in more than 6 months. Ineligibility criteria for study subjects were body temperature ≥37.5 °C, clear externally caused injury, visual impairment, or auditory difficulties, because these conditions were considered to be likely to interfere with individuals' ability to fill out the questionnaires. Eligible patients were consecutively asked to participate in the study at each clinic. A total of 600 subjects (200 from each clinic) were enrolled in the study. One subject participated in this study twice and another subject was found to be 65.4 years old (i.e., over 65 years). These two subjects were excluded. Of 598 enrollees, 187 were excluded. Of these, 153 were assessed as depressed at enrollment, 14 enrollees without depression at enrollment had a diagnosed history of a depressive state (four subjects), depressive disorder (eight subjects), or bipolar disorder (two subjects), and 20 subjects without depression at enrollment or the diagnosed history mentioned above had suicidal ideation at enrollment (Figure 1). Of the remaining 411 subjects, 387 participated in a follow-up investigation at 6 months after enrollment.

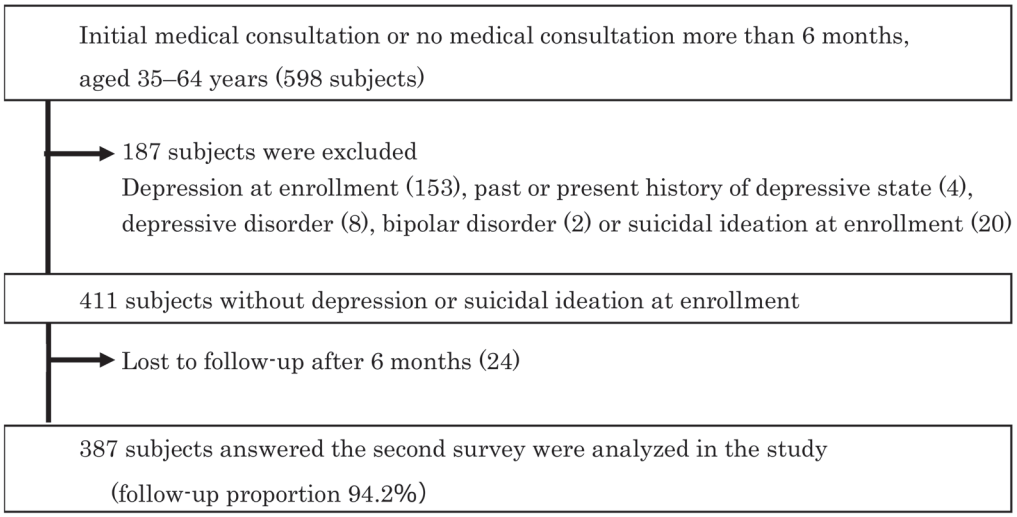

Figure 1. Flow chart of enrollment of the study subjects.

The Ethics Committee of Kurume University approved the study protocol (No. 10286). This study was conducted in accordance with the Declaration of Helsinki (October 2008). Written informed consent was obtained from all subjects before participation.

2.2. Information Collection

The details of information collection for this study have been previously described [20]. Briefly, subjects were asked to fill out three self-administered, structured questionnaires to provide physical, mental, and environmental information at the time of enrollment before medical consultation. Consulting physicians also filled out a structured questionnaire. The self-administered questionnaires were not shown to the physicians to avoid influencing the physicians' diagnoses.

Information from the first self-administered questionnaire included sex, age, exercise habits, major life events, relationship problems in the workplace, family discord, alcohol and smoking history (including amount per day), educational background, occupation, marital status, family history of psychiatric disorders, psychiatric illnesses, and other underlying diseases. Feeling of isolation from other family members was measured using a visual analogue scale consisting of a 100 mm horizontal line; this ranged from no feeling of isolation to a feeling of extreme isolation. The Japanese version of the Pittsburgh Sleep Quality Index (PSQI) was included to assess sleep status [44,45]. In addition, the Japanese version of the

Zung Self-Rating Depression Scale (SDS) and the Profile of Mood States (POMS) were used to assess depression [46–52]. The questionnaire for physicians collected information on diagnosis, chief complaints, prescriptions, and referral to a mental health specialist.

At 6 months after enrollment, subjects were asked to fill out a questionnaire inquiring about workplace absences and/or sick leave during the past 6 months, reasons and diagnoses for any absenteeism, medical consultation at psychosomatic medicine and/or psychiatric clinics and/or hospitals, and the name of any medical institutions where consultation for psychiatric problems took place. The SDS and POMS were also re-administered.

Reliability and validity tests of the Japanese version of the PSQI, SDS, and POMS were previously conducted in Japan [44,47,50]. However, we also tested their reliability and validity in this study. The Cronbach's alpha for the seven component scores of the PSQI global score was 0.577 among 387 subjects [44]. This is because depressive subjects were removed from the 598 enrolled subjects. This result is consistent with the previous investigation, which showed that lower Cronbach's alphas were observed among control subjects (0.43), while higher Cronbach's alphas were observed among subjects with major depression (0.72) and subjects with primary insomnia (0.74) [44]. In the present study, among 387 subjects, the standardized Cronbach's alpha for 15 component items in the depression–dejection subscale of POMS at 6 months and for 20 items in the SDS at 6 months were 0.837 and 0.796, respectively [47,50]. This is much greater than the suggested value of 0.70 [53]. The mean, median, and standard deviation of the depression–dejection subscale score of POMS were 8.9, 9.0, and 4.5 among subjects without DSI and 17.0, 16.0, and 6.1 among subjects with DSI, respectively, with a p value in the Wilcoxon rank sum test <0.0001. The mean, median, and standard deviation of the SDS were 36.5, 36.0, and 6.8 among subjects without DSI and 50.0, 49.0, and 7.9 among subjects with DSI, respectively, with a p value <0.0001. For the PSQI, the mean, median, and standard deviation were 4.6, 4.0, and 2.2 among subjects without DSI and 6.9, 7.0, and 3.2 among subjects with DSI, respectively, with a p value of 0.007.

2.3. Definition of Poor Sleep and Fatigue on Waking

The PSQI is a self-administered questionnaire designed to assess quantitative and qualitative aspects of sleep during the previous month [44,45]. Individuals with a global score of $\geq$6 are defined as poor sleepers, whereas those with scores of $\leq$5 are defined as good sleepers. Both global scores and scores for individual items, such as sleep quality, frequency of difficulty falling asleep, and frequency of waking in the middle of the night or early morning, were used for the analyses. The Japanese version of the Epworth Sleepiness Scale was also used to measure drowsiness in the daytime [54,55].

In addition, the frequency of fatigue on waking was measured by the question "Do you have difficulty getting up because of fatigue?" Subjects were asked to choose the most appropriate answer, as follows: "none", "less than once per month", "once or more per month but less than once per week", or "once or more per week". This question is referred to as "fatigue on waking" in the following text and tables.

2.4. Case Definition

Subjects who were assessed as being in a depressed state by both the SDS and POMS were defined as having depression. We used the SDS translated into Japanese; this scale contains 20 items, scored from 1 to 4 [48]. The total score was multiplied by 1.25 to obtain the SDS index [48]. An SDS index value of 50, equivalent to a raw score of 40, was used as a morbidity cutoff score [48]. The POMS assesses six mood states. The depression–dejection subscale score is calculated from responses to 15 items, with a score range from 0 to 60 [51]. The mean plus the standard deviation of a so-called healthy adult population was used as the cutoff score for depressive mood state (cutoff scores are 18.3, 16.3, 16.9, and 13.7 for males and 17.4, 16.3, 14.2, and 12.8 for females aged 35–39, 40–49, 50–59, and $\geq$60 years, respectively) [51].

Suicidal ideation was measured using the question "I feel that others would be better off if I were dead", which is included in the SDS [56]. Subjects answering "some of the time", "a good part of the time", or "most or all of the time" were defined as having suicidal ideation.

2.5. Data Analyses

Subjects with and without depression accompanied by suicidal ideation were compared using the chi-square test or Fisher's exact test. For continuous variables, the Wilcoxon rank sum test was used. Sensitivity, specificity, positive and negative predictive value, positive likelihood ratios (LR+), and negative likelihood ratios (LR−) of associated factors for DSI were calculated [57,58]. The formula "pretest odds × likelihood ratio = posttest odds" was used. Pretest odds were derived using the formula "pretest odds = prevalence/(1 − prevalence)." Posttest probability was derived using the formula "posttest probability = posttest odds/(1 + posttest odds)" [58]. Pretest probability and posttest probability correspond to pre-inquiry probability and post-inquiry probability, respectively, in the following text.

To assess predictive factors for DSI, adjusted odds ratios (ORs) and their 95% confidence intervals (95% CIs) were calculated using logistic regression. All analyses except for likelihood ratios and their CIs were conducted using SAS version 9.4 (SAS Institute Inc., Cary, NC, USA). A p value of less than 0.05 (two-sided) was considered significant.

Correlations of fatigue on waking and factors related to sleep status (global and individual PSQI score, global and individual Epworth Sleepiness Scale score (sleepiness during daytime)), alcohol consumption, feeling of isolation, economic difficulty, and total SDS score at enrollment and 6 months after enrollment were calculated.

Explanatory variables of the model were sex, age, regular exercise habits, problems involving care of the family, death of a family member, relationship problems in the workplace, cigarette smoking, history of psychiatric disorder excluding dementia in parent(s) or child (children), educational background, mean alcohol consumption per day [59], feeling of isolation from other family members, and fatigue on waking (Model 1) or PSQI global score (Model 2). The stepwise method with default p values of 0.05 to enter and remove was used to determine the final model. Regular exercise habits, problems involving care of the family, death of a family member, relationship problems in the workplace, cigarette smoking, history of psychiatric disorder excluding dementia in parent(s) or child (children), mean alcohol consumption per day and fatigue on waking were selected through the stepwise method. Feeling of isolation from other family members and PSQI global score were included in the final models because of statistical significance in the univariate analysis. Demographic variables of sex, age, and educational background were included in the final models irrespective of stepwise selection and statistical significance in the univariate analysis.

Mean alcohol consumption per day was calculated using grams of ethanol and a standard conversion table for alcoholic beverages (i.e., beer was assumed to be 5% ethanol, wine 12%, sake 15%, shochu 25%, and whiskey 40%) [59].

Power analysis after the investigation was conducted using an SAS power procedure. Two-category variables of relationship problems in the workplace (no and yes), fatigue on waking divided into two categories ("less than once per month" and "once or more per month"), and the global score of PSQI divided into two categories of ("5 or less [no sleep disturbance]" and "6 or more [sleep disturbance]"), ("6 or less" and "7 or more"), and ("9 or less" and "10 or more") were used for power analysis. The frequencies and their ORs for DSI were also used for power analysis.

3. Results

Of the 411 subjects eligible for follow-up, 387 (94.2%) completed the second survey at 6 months after enrollment. Data from the 387 subjects were analyzed. The median age of subjects was 49.0 years with a range of 35.1–64.4 years (1st quartile: 41.4, 3rd quartile: 56.4), and 48.6% were male. At the initial medical consultation, respiratory system diseases, including the common cold, defined through the International Statistical Classification of Diseases and Related Health Problems, Tenth Revision (ICD-10) code J00–J99, were most frequent (40.1%). Diseases occurring with high frequency were those of the musculoskeletal system and connective tissue (M00–M99) (12.9%), endocrine, nutritional, and metabolic diseases (E00–E90) (10.9%), circulatory system diseases (I00–I99) (10.3%), and digestive

system diseases (K00–K93) (7.0%). No subjects had psychotic symptoms or dementia at the initial medical consultation.

DSI was observed in 13 subjects (3.4%). Table 1 shows the characteristics of all subjects and the adjusted ORs for DSI. Significantly increased ORs were observed for fatigue on waking once or more per month but less than once per week (OR: 7.90 [95% CI: 1.06–58.7]) and once or more per week (OR: 6.79 [1.02–45.1]) in Model 1. Increased ORs were observed for total PSQI scores of 6, 7–9, and ≥10; the OR for scores of ≥10 was significant (OR: 8.19 [1.05–63.8]) in Model 2, with a significant dose–response relationship (p for trend: 0.038). Significant ORs were observed for relationship problems in the workplace (OR: 4.24 [1.00–17.9] and OR: 4.84 [1.14–20.6]) in Model 1 and Model 2, respectively.

Table 1. Odds ratios for depression with suicidal ideation (DSI) and characteristics of subjects with and without DSI among primary care patients aged 35–64 years.

	Subjects with DSI (n = 13) n (%)		Subjects without DSI (n = 374) n (%)		Crude		Model 1 †		Model 2 ‡	
					OR (95% CI)	p Value	OR (95% CI)	p Value	OR (95% CI)	p Value
Sex										
Male	6	(46.2)	182	(48.7)	1.00		1.00		1.00	
Female	7	(53.9)	192	(51.3)	1.11 (0.37–3.35)	0.859	2.43 (0.46–12.9)	0.296	2.64 (0.46–15.1)	0.277
Age (median, range)	52.0 (40.0–64.3)		48.9 (35.1–64.4)							
35–44 (years)	3	(23.1)	145	(38.8)	1.00		1.00		1.00	
45–54	8	(61.5)	120	(32.1)	3.22 (0.84–12.4)	0.089	5.64 (0.96–33.3)	0.056	4.19 (0.70–25.3)	0.118
55–64	2	(15.4)	109	(29.1)	0.89 (0.15–5.40)	0.896	2.52 (0.28–23.0)	0.414	1.20 (0.14–10.3)	0.867
					(p for trend 0.933)		(p for trend 0.288)		(p for trend 0.810)	
Regular exercise										
Less than once per month	12	(92.3)	244	(65.2)	1.00		1.00		1.00	
Once or more per month	1	(7.7)	130	(34.8)	0.16 (0.02–1.22)	0.076	0.17 (0.02–1.76)	0.136	0.19 (0.02–1.82)	0.148
Problems involving care of an ill or elderly family member during the previous 6 months										
No	10	(76.9)	345	(92.3)	1.00		1.00		1.00	
Yes	3	(23.1)	29	(7.8)	3.57 (0.93–13.7)	0.064	4.44 (0.76–25.9)	0.098	5.61 (0.88–35.6)	0.067
Death of a family member during the previous 6 months										
No	11	(84.6)	361	(96.5)	1.00		1.00		1.00	
Yes	2	(15.4)	13	(3.5)	5.05 (1.01–25.1)	0.048	3.23 (0.38–27.8)	0.286	3.07 (0.35–26.8)	0.310
Relationship problems in the workplace										
No	7	(53.9)	324	(86.6)	1.00		1.00		1.00	
Yes	6	(46.2)	50	(13.4)	5.56 (1.79–17.2)	0.003	4.24 (1.00–17.9)	0.049	4.84 (1.14–20.6)	0.033
Cigarette smoking										
Never or former	6	(46.2)	286	(76.5)	1.00		1.00		1.00	
Current	7	(53.9)	88	(23.5)	3.79 (1.24–11.6)	0.019	7.48 (1.27–44.2)	0.027	3.42 (0.65–17.9)	0.146
History of psychiatric disorder excluding dementia in parent(s) or child (children)										
None	10	(76.9)	350	(93.6)	1.00		1.00		1.00	
Parent(s) or child (children) with psychiatric illness(es)	3	(23.1)	24	(6.4)	4.38 (1.13–17.0)	0.033	4.94 (0.85–28.6)	0.074	3.03 (0.45–20.2)	0.253
Educational background										
Junior high school	1	(7.7)	15	(4.0)	1.74 (0.20–15.1)	0.614	1.01 (0.03–31.2)	0.998	1.61 (0.06–42.0)	0.776
High school	7	(53.9)	183	(48.9)	1.00		1.00		1.00	
Technical school, junior college, or higher vocational school	2	(15.4)	88	(23.5)	0.59 (0.12–2.92)	0.522	0.34 (0.04–2.59)	0.296	0.24 (0.02–2.32)	0.216
University or graduate school	3	(23.1)	88	(23.5)	0.89 (0.23–3.53)	0.870	0.93 (0.15–5.84)	0.941	0.77 (0.12–4.72)	0.773

Table 1. *Cont.*

	Subjects with DSI (n = 13) n (%)		Subjects without DSI (n = 374) n (%)		Crude		Model 1 †		Model 2 ‡	
					OR (95% CI)	p Value	OR (95% CI)	p Value	OR (95% CI)	p Value
Mean alcohol consumption per day										
non-drinker	2	(15.4)	147	(39.3)	1.00		1.00		1.00	
≤34 (g)	10	(76.9)	186	(49.7)	3.95 (0.85–18.3)	0.079	4.71 (0.77–28.7)	0.093	4.74 (0.71–31.8)	0.109
>34	1	(7.7)	41	(11.0)	1.79 (0.16–20.3)	0.637	3.50 (0.17–70.3)	0.413	3.51 (0.18–67.4)	0.406
					(p for trend 0.261)		(p for trend 0.169)		(p for trend 0.209)	
Feeling of isolation from other family members (visual analogue scale)										
<10.0 (mm)	7	(53.9)	302	(80.8)	1.00		1.00		1.00	
10.0–19.9	2	(15.4)	25	(6.7)	3.45 (0.68–17.5)	0.135	2.92 (0.33–25.7)	0.335	3.35 (0.42–26.5)	0.252
≥20.0	4	(30.8)	47	(12.6)	3.67 (1.04–13.0)	0.044	1.91 (0.36–10.1)	0.447	2.98 (0.54–16.4)	0.210
					(p for trend 0.030)		(p for trend 0.320)		(p for trend 0.145)	
Fatigue on waking										
Less than once per month	3	(23.1)	240	(64.2)	1.00		1.00			
Once or more per month but less than once per week	4	(30.8)	43	(11.5)	7.44 (1.61–34.4)	0.010	7.90 (1.06–58.7)	0.043		
Once or more per week	6	(46.2)	91	(24.3)	5.28 (1.29–21.5)	0.021	6.79 (1.02–45.1)	0.048		
					(p for trend 0.015)		(p for trend 0.051)			
Global score on Pittsburgh Sleep Quality Index										
≤5	4	(30.8)	259	(69.3)	1.00				1.00	
6	2	(15.4)	47	(12.6)	2.76 (0.49–15.5)	0.250			2.15 (0.28–16.5)	0.463
7–9	5	(38.5)	58	(15.5)	5.58 (1.45–21.4)	0.012			3.22 (0.56–18.7)	0.193
≥10	2	(15.4)	10	(2.7)	13.0 (2.12–79.2)	0.006			8.19 (1.05–63.8)	0.045
					(p for trend 0.001)				(p for trend 0.038)	

DSI: depression with suicidal ideation; OR: odds ratio; CI: confidence interval. † Explanatory variables: sex, age, regular exercise habits, problems involving care of the family, death of a family member, relationship problems in the workplace, cigarette smoking, history of psychiatric disorder excluding dementia in parent(s) or child (children), educational background, mean alcohol consumption per day, feeling of isolation from family members, and fatigue on waking. ‡ Explanatory variables: sex, age, regular exercise habits, problems involving care of the family, death of a family member, relationship problems in the workplace, cigarette smoking, history of psychiatric disorder excluding dementia in parent(s) or child (children), educational background, mean alcohol consumption per day, feeling of isolation from family members, and Pittsburgh Sleep Quality Index global score.

Conversely, no significant adjusted ORs were observed for difficulty falling asleep within 30 min, waking in the middle of the night or early morning, quality of sleep and average length of sleep during the past month. After adjustment for variables in Model 1, except for fatigue on waking, the OR for difficulty falling asleep within 30 min less than once per week was 2.15 (95% CI, 0.42–11.1), that for 1–2 times per week was 0.57 (0.03–12.8), and that for ≥3 times per week was 5.47 (0.71–42.0) compared with no difficulty. The OR for waking in the middle of the night or early morning less than once per week was 4.61 (0.85–24.9), 1–2 times per week was 1.49 (0.18–12.6), and ≥3 times per week was 1.35 (0.09–20.5) compared with not waking in the middle of the night or early morning. For the same adjustment variable, adjusted ORs of "fairly bad" and "very bad" compared with "fairly good or very good" sleep quality were 2.55 (95% CI, 0.56–11.7) and 8.76 (95% CI, 0.47–162), respectively.

Additional analysis was conducted to investigate interactions in variables. Relationship problems in the workplace is a two-category variable: no and yes. Fatigue on waking was divided into two categories: "less than once per month" and "once or more per month". The global score of PSQI was divided into two categories: "5 or less (no sleep disturbance)" and "6 or more (sleep disturbance)". Multivariate analysis was conducted with the three two-category variables included simultaneously in the model (Model 3) (not shown in Table 1). The explanatory variables of Model 3 other than the three variables (relationship problems in the workplace, fatigue on waking, PSQI score) were the same as those used in Model 1, except for relationship problems in the workplace and fatigue on waking. In Model 3, the ORs were as follows: relationship problems in the

workplace (3.36 [0.78–14.4]), fatigue on waking once or more per month (6.07 [1.02–36.1]), and PSQI score ≥ 6 (2.72 [0.61–12.1]). Only fatigue on waking once or more per month showed a significant association with DSI. The most significant factor in predicting suicidal ideation was fatigue on waking in this model. Model 3 was employed to calculate the interaction of the three variables. No significant interactions were observed for relationship problems in the workplace and fatigue on waking ($p = 0.836$), fatigue on waking and PSQI score ($p = 0.576$), or relationship problems in the workplace and PSQI score ($p = 0.904$).

Sensitivity and specificity, positive and negative predictive values, and likelihood ratios for DSI were calculated (Table 2). The lowest LR− (0.171) was observed for "relationship problems in the workplace (RPW), PSQI score ≥ 6 (PS6), or fatigue on waking once or more per month (FWM)." High LR+ values (57.54, 11.99, and ∞) were observed for "relationship problems in the workplace (RPW) and PSQI score ≥ 10 (PS10)," "relationship problems in the workplace (RPW), PSQI score ≥ 6 (PS6), and fatigue on waking once or more per month (FWM)," and "relationship problems in the workplace (RPW), PSQI score ≥ 10 (PS10), and fatigue on waking once or more per week (FWW)," respectively. For subjects who did not have "relationship problems in the workplace, PSQI score ≥ 6, or fatigue on waking once or more per month (RPW, PS6, or FWM)" the post-inquiry probability was 0.59% with a negative predictive value of 99.41%. Table 2 displays the value as 99.4 because 99.41 was rounded to a single decimal place. "Relationship problems in the workplace, PSQI score ≥ 6, and fatigue on waking once or more per month (RPW, PS6 and FWM)" and "relationship problems in the workplace and PSQI score ≥ 10 (RPW and PS10)" showed post-inquiry probabilities of 29.4% and 66.7%, respectively. Two subjects had relationship problems in the workplace (RPW), PSQI score ≥ 10 (PS10), and fatigue on waking once or more per week (FWW) at enrollment. Both of these subjects developed DSI.

Table 2. Sensitivity, specificity, positive and negative predictive values, and likelihood ratios for depression with suicidal ideation (DSI) among primary care patients aged 35–64 years.

Condition	Sensitivity (%) (95% CI)	Specificity (%) (95% CI)	Positive Predictive Value (%) (95% CI)	Negative Predictive Value (%) (95% CI)	Positive Likelihood Ratio (95% CI)	Negative Likelihood Ratio (95% CI)	DSI/Number of Subjects with Condition (s)
Relationship problems in the workplace, Pittsburgh Sleep Quality Index score ≥ 10, and fatigue on waking once or more per week (RPW, PS10, and FWW)	15.4 (1.9–45.5)	100 (99.0–100)	100 (15.8–100)	97.1 (95.0–98.6)	∞	0.846 (0.671–1.067)	2/2
Relationship problems in the workplace and Pittsburgh Sleep Quality Index score ≥ 10 (RPW and PS10)	15.4 (1.9–45.5)	99.7 (98.5–99.99)	66.7 (9.4–99.2)	97.1 (94.9–98.6)	57.54 (5.565–594.9)	0.848 (0.673–1.070)	2/3
Relationship problems in the workplace, Pittsburgh Sleep Quality Index score ≥ 6, and fatigue on waking once or more per month (RPW, PS6, and FWM)	38.5 (13.9–68.4)	96.8 (94.5–98.3)	29.4 (10.3–56.0)	97.8 (95.8–99.1)	11.99 (4.949–29.04)	0.636 (0.414–0.978)	5/17
Relationship problems in the workplace and Pittsburgh Sleep Quality Index score ≥ 6 (RPW and PS6)	46.2 (19.2–74.9)	94.4 (91.5–96.5)	22.2 (8.6–42.3)	98.1 (96.0–99.2)	8.220 (4.004–16.88)	0.570 (0.345–0.944)	6/27
Relationship problems in the workplace and fatigue on waking once or more per week (RPW and FWW)	38.5 (13.9–68.4)	95.2 (92.5–97.1)	21.7 (7.5–43.7)	97.8 (95.7–99.1)	7.991 (3.512–18.18)	0.646 (0.420–0.994)	5/23
Pittsburgh Sleep Quality Index score ≥ 10 (PS10)	15.4 (1.9–45.5)	97.3 (95.1–98.7)	16.7 (2.1–48.4)	97.1 (94.8–98.5)	5.754 (1.399–23.66)	0.869 (0.689–1.097)	2/12

Table 2. *Cont.*

Condition	Sensitivity (%) (95% CI)	Specificity (%) (95% CI)	Positive Predictive Value (%) (95% CI)	Negative Predictive Value (%) (95% CI)	Positive Likelihood Ratio (95% CI)	Negative Likelihood Ratio (95% CI)	DSI/Number of Subjects with Condition (s)
Relationship problems in the workplace and fatigue on waking once or more per month (RPW and FWM)	38.5 (13.9–68.4)	93.3 (90.3–95.6)	16.7 (5.6–34.7)	97.8 (95.6–99.0)	5.754 (2.624–12.62)	0.659 (0.429–1.014)	5/30
Relationship problems in the workplace (RPW)	46.2 (19.2–74.9)	86.6 (82.8–89.9)	10.7 (4.0–21.9)	97.9 (95.7–99.2)	3.452 (1.818–6.556)	0.622 (0.375–1.030)	6/56
Relationship problems in the workplace or Pittsburgh Sleep Quality Index score $\geq$ 10 (RPW or PS10)	46.2 (19.2–74.9)	84.2 (80.1–87.8)	9.2 (3.5–19.0)	97.8 (95.6–99.1)	2.926 (1.555–5.505)	0.639 (0.386–1.060)	6/65
Pittsburgh Sleep Quality Index score $\geq$ 6 (PS6)	69.2 (38.6–90.9)	69.3 (64.3–73.9)	7.3 (3.4–13.3)	98.5 (96.2–99.6)	2.252 (1.520–3.336)	0.444 (0.196–1.007)	9/124
Fatigue on waking once or more per month (FWM)	76.9 (46.2–95.0)	64.2 (59.1–69.0)	6.9 (3.4–12.4)	98.8 (96.4–99.7)	2.147 (1.548–2.978)	0.360 (0.133–0.973)	10/144
Relationship problems in the workplace or fatigue on waking once or more per month (RPW or FWM)	84.6 (54.6–98.1)	57.5 (52.3–62.6)	6.5 (3.3–11.3)	99.1 (96.7–99.9)	1.990 (1.535–2.581)	0.268 (0.075–0.960)	11/170
Fatigue on waking once or more per week (FWW)	46.2 (19.2–74.9)	75.7 (71.0–79.9)	6.2 (2.3–13.0)	97.6 (95.1–99.0)	1.897 (1.027–3.504)	0.712 (0.429–1.181)	6/97
Relationship problems in the workplace or Pittsburgh Sleep Quality Index score $\geq$ 6 (RPW or PQ6)	69.2 (38.6–90.9)	61.5 (56.4–66.5)	5.9 (2.7–10.9)	98.3 (95.7–99.5)	1.798 (1.224–2.641)	0.500 (0.221–1.135)	9/153
Relationship problems in the workplace, Pittsburgh Sleep Quality Index score $\geq$ 6, or fatigue on waking once or more per month (RPW, PS6, or FWM)	92.3 (64.0–99.8)	44.9 (39.8–50.1)	5.5 (2.9–9.4)	99.4 (96.8–99.99)	1.676 (1.397–2.010)	0.171 (0.026–1.130)	12/218
Relationship problems in the workplace or fatigue on waking once or more per week (RPW or FWW)	53.9 (25.1–80.8)	67.1 (62.1–71.9)	5.4 (2.2–10.8)	97.7 (95.0–99.1)	1.637 (0.970–2.764)	0.688 (0.381–1.242)	7/130
Relationship problems in the workplace, Pittsburgh Sleep Quality Index score $\geq$ 10, or fatigue on waking once or more per week (RPW, PQ10, or FWW)	53.9 (25.1–80.8)	65.0 (59.9–69.8)	5.1 (2.1–10.2)	97.6 (94.8–99.1)	1.537 (0.912–2.591)	0.710 (0.393–1.284)	7/138

Note: Specificity is 100% thus the positive likelihood ratio is showed as infinity "∞". DSI: depression with suicidal ideation; CI: confidence interval. RPW: relationship problems in the workplace. PS10: Pittsburgh Sleep Quality Index score $\geq$ 10, PS6: Pittsburgh Sleep Quality Index score $\geq$ 6. FWM: fatigue on waking once or more per month, FWW: fatigue on waking once or more per week.

Weak but statistically significant correlations were observed between fatigue on waking and rating of sleep quality (Spearman's correlation coefficient of r = 0.286, $p < 0.0001$), fatigue on waking and total PSQI score (r = 0.267, $p < 0.0001$), and fatigue on waking and difficulty maintaining enough enthusiasm to get things done (one of the items included in the PSQI) (r = 0.220, $p < 0.0001$). Thus, the correlated variables of fatigue on waking and total PSQI score were not included simultaneously as explanatory variables in the calculations shown in Table 1.

The calculated statistical powers were 0.797 for relationship problems in the workplace, 0.813 for fatigue on waking, 0.780 for PSQI score ($\leq$5 and $\geq$6), 0.797 for PSQI score ($\leq$6 and $\geq$7), and 0.635 for PSQI score ($\leq$9 and $\geq$10). Only fatigue on waking showed a higher power than 0.8, but all calculated values were higher than 0.5 [60].

4. Discussion

Because the number of subjects was small, the results of the present investigation should be interpreted carefully. Only 13 subjects had DSI. More studies using different methods with larger sample sizes in different places are needed to confirm our findings.

The three predictive factors for DSI identified in this study were fatigue on waking, poor sleep, and relationship problems in the workplace. Significantly increased ORs were observed for fatigue on waking (ORs: 7.90 and 6.79), total PSQI score of ≥10 (OR: 8.19), and relationship problems in the workplace (ORs: 4.24 and 4.84). These predictive factors may be useful for predicting DSI in a primary care setting at 6 months from the initial medical consultation. These findings may also help physicians to decide, within a period of 6 months, whether to initiate treatment or refer the patient to a mental health specialist.

The current investigation involved several unique aspects. First, the subjects were 387 new primary care patients without depression. Second, 13 newly identified cases (i.e., incident cases) of DSI were observed at 6 months after an initial medical consultation. Third, the 6-month follow-up was shorter than in previous investigations that followed subjects for years to decades [26,61–63]. Periods of several years of observation with no treatment are excessively long and are impractical in clinical practice.

Combinations of these three conditions—fatigue on waking, poor sleep, and relationship problems in the workplace—showed high LRs+ of 11.99 to ∞ and the lowest LR− of 0.171. High LR+ and low LR− indicate specific questions and sensitive questions, respectively. Specific combinations of symptoms can be used in the diagnostic process, and sensitive combinations of the symptoms may be used to rule out a diagnosis. In general, tests with LRs further from 1.0 are associated with fewer false positives and fewer false negatives [58]. The most sensitive combination of "relationship problems in the workplace, PSQI score ≥ 6, or fatigue on waking once or more per month (RPW, PS6, or FWM)" had the lowest LR− of 0.171. Subjects who did not have any of these three conditions had a post-inquiry probability of DSI of 0.59%. This was clearly lower than the pre-inquiry probability of 3.36% (calculated by dividing the number of patients with DSI [13 subjects] by the total number of subjects [387 subjects]). The specific combinations of "relationship problems in the workplace, PSQI score ≥ 6, and fatigue on waking once or more per month (RPW, PS6, and FWM)" and "relationship problems in the workplace and PSQI score ≥ 10 (RPW and PS10)" showed post-inquiry probabilities of 29.4% and 66.7%, respectively; these were substantially higher than the pre-inquiry probability of 3.36%. If physicians took the time to inquire about fatigue on waking and relationship problems in the workplace, and determined the patient's total PSQI score, they might be able to more quickly evaluate the probability of DSI within 6 months. Even during monthly or weekly follow-ups, these three factors may help to predict DSI, enabling physicians to initiate timely treatment for depression or initiate a referral to a mental health specialist.

Riihimäki et al., reported that one-tenth of primary care patients with depressive disorders attempted suicide within 5 years. They also found that a current major depressive episode was a significant independent risk factor (hazard ratio 33.5 [95% CI: 3.6–309.7]) [26]. Barraclough et al., investigated hundreds of suicides and found that 70% of deceased subjects had depression [64]. Chynoweth et al., conducted a similar investigation of 135 suicides and found that 55% had a depressive disorder [65]. Because of the increased risk of suicide among depressive patients, we explored predictive factors for DSI.

Two meta-analyses examined studies on insomnia and suicidal behavior in populations other than primary care patients [27,28]. Pigeon et al., reported that sleep disturbances showed significant associations with suicidal ideation, suicide attempts, and suicide (OR: 1.86–2.01) [28]. Malik et al., reported a significant association between sleep disturbances and suicidal behaviors among depressive patients (OR: 3.05 [2.07–4.48], $p < 0.001$) [27]. However, Skapinakis et al., reported that some previous studies may have overestimated the importance of sleep disturbances as an independent risk factor for depression [66]. They explained that a strong cross-sectional association is compatible with sleep disturbances as a prodromal or residual symptom of depression.

Owusu et al., reported an association of sleep characteristics with suicidal ideation and suicide attempt among adults aged 50 and older with depressive symptoms in low- and middle-income countries [67]. They showed that subjects with poor/very poor sleep quality had greater odds of suicidal ideation. Subjects with moderate and severe/extreme insomnia symptoms had greater odds of suicidal ideation and suicide attempts. These findings are consistent with those of the present investigation. Severe insomnia with PSQI score ≥ 10 was significantly associated with DSI. However, sleep quality was not associated with DSI in multivariate analyses in the present study, as mentioned in the Results section. This may be partly due to the small sample size of the present investigation.

In the current study, subjects with a depressive history or with depression or suicidal ideation at enrollment (at the initial medical consultation), who might not be at risk for newly identified DSI after 6 months, were excluded, because predictive factors of newly identified cases may differ from those of recurrent or persistent cases [68,69]. Subjects who had poor sleep at the initial medical consultation because of depressive symptoms were excluded from this study. Thus, the cross-sectional effect of poor sleep (i.e., PSQI global score) and DSI was minimized. This may explain why waking in the middle of the night or early morning, difficulty falling asleep within 30 min, quality of sleep, and average length of sleep in the past month did not show a significant association with DSI in the present study.

Chronic physical illness was found to be a predictor of suicidal behavior in a previous investigation [70]. Additionally, associations between depression and physical illnesses were reported previously [71–73]. However, we did not find an association between DSI and physical illnesses (e.g., circulatory illnesses, diabetes, or stroke) in the current study, possibly because patients who required periodical consultation at a medical institution for severe physical illnesses were unlikely to have been included in our investigation. Enrolled subjects were new patients who visited one of three primary care clinics for an initial medical consultation, not for regular consultation.

We found that relationship problems in the workplace showed a significant association with DSI. Previous studies have reported similar results. A cross-sectional study showed that interpersonal conflict was significantly associated with depression, particularly among highly educated males [35]. Another cross-sectional study reported that poor social support was independently associated with suicidal ideation (OR: 3.1 [95% CI: 2.6–3.7]) [74]. In that study, poor social support showed a relatively high population attributable fraction of 38% for suicidal ideation [74]. A study of two nationally representative samples (one from England and one from the United States) also reported a significant negative association between social support and suicide attempts (OR = 0.68–0.93) [75]. The present findings suggest that inquiries should focus not only on an individual's health problems but also on their relationship problems to prevent DSI.

Associations between social functioning and depression have been reported [76,77]. In this present study, ORs for DSI for similar items included in the social functioning scale [78], such as occupation, type of employment, marital status, family member, family member living together, outpatient visits to other clinic(s) or hospital(s), and feeling of isolation from other family members, were calculated (univariate analysis). In the univariate analyses, only feeling of isolation from other family members ($\geq$20.0 mm in visual analogue scale) showed a significant OR (3.67 [1.04–13.0]). Therefore, a feeling of isolation from other family members was included in the final model shown in Table 1. Because of the limited sample size of the present investigation, a feeling of isolation from other family members might not show a significant OR in the multivariate analysis.

According to the American Psychiatric Association's Diagnostic and Statistical Manual of Mental Disorders Fifth Edition (DSM-5), to be classified as depressive, patients must be experiencing five or more depressive symptoms most of the day, nearly every day, during the same 2-week period, and at least one of the symptoms must be either depressed mood or loss of interest/pleasure. Additionally, depressive symptoms must cause clinically significant distress or impairment in social, occupational, or other important areas of functioning, and the symptoms must not be caused by substance abuse or

another medical condition. Although the diagnosis of depression in this study did not fully correspond to the DSM-5 [79], we succeeded in eliminating the observer bias that can occur when multiple interviewers make diagnoses [80]. Our use of the SDS and POMS, which are widely employed for clinical and research purposes, enabled us to assess all subjects using consistent criteria without observer bias. Observer bias could have caused unexpected over- or under-estimation of the association between predictive factors and DSI [69]. Additionally, patients with psychosis or dementia, whose ability to report their condition may be impaired, were not included in this study [80].

The current study involved several limitations. First, the number of enrolled subjects was small because we aimed to obtain complete datasets despite limited resources. Power analyses were difficult to conduct before the data collection of the current study. The frequency of newly identified cases of DSI after several months, relationships in the workplace, and fatigue on waking among non-depressed primary care patients were not investigated, as far as we know. Additionally, this was not a nationwide multicenter study; it was conducted at only three internal medicine clinics located in Fuji City, which is an industrial city with a population of 250,000. Because most enrolled subjects (99.5%) were inhabitants of Fuji City and its surrounds, differences in subject characteristics related to place of residence were minimized. Another limitation is that we did not identify whether fatigue on waking and total PSQI score represented prodromal symptoms or causes of DSI. Finally, suicidal ideation was only assessed using self-administered questionnaires. One item in the SDS ("I feel that others would be better off if I were dead"), which was used to assess suicidal ideation, may reflect suicidal thought rather than suicide attempts (suicidal behaviors) [81]. According to Kessler, approximately 90% of unplanned suicide attempts and 60% of planned first suicide attempts occur within 1 year of the onset of ideation [82]. Thus, it is reasonable to investigate suicidal ideation because suicidal ideation is the first layer of the pyramid of occurrence of suicidal ideation and non-fatal and fatal behavior [81].

This study focuses on the three identified predictive factors that may assist doctors in detecting patients who are at risk of suicidal ideation. Managing depression symptoms, recognizing depression, and beginning treatment are still important because of the increased risk of suicide among depressive patients, as mentioned in the Introduction and Discussion sections. In a time-constrained busy primary care setting, depression is frequently overlooked. Thus, not only physicians but also other health care professionals need to assess and identify the signs and symptoms of depression to prevent suicidal ideation and behaviors.

The present results must be interpreted carefully, and the findings may not be generalizable beyond middle-aged primary care patients. The results in the current study may also not be generalizable to the period after 2019. The COVID-19 pandemic has altered social, working, and home environments [83,84]. According to the Organisation for Economic Co-operation and Development (OECD) Health at a Glance 2021, the prevalence of anxiety and depression were more than double the levels observed before the COVID-19 pandemic in most countries, including Japan, with available data [85]; however, the restrictions of the pandemic on society have eased as of March 2023 in Japan. The effects of the pandemic may influence the prevalence of mental disease for several years beyond the peak of the pandemic.

Further studies using different methods in different locations will be needed to clarify the predictive and risk factors for DSI in the primary care setting.

5. Conclusions

Signs of DSI often go undetected in primary care facilities, particularly during initial consultations in a busy clinical practice. The present results revealed that inquiring about the frequency of fatigue on waking, sleep status and relationship problems in the workplace may be helpful for predicting DSI in primary care settings. Because the sample size in this investigation was small, further studies with larger samples are needed to confirm our findings.

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Attempted Suicide Is Independently Associated with Increased In-Hospital Mortality and Hospital Length of Stay among Injured Patients at Community Tertiary Hospital in Japan: A Retrospective Study with Propensity Score Matching Analysis

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Abstract: Suicide is an increasingly important public healthcare concern worldwide. Studies examining the effect of attempted suicide on clinical outcomes among patients with trauma are scarce. We conducted a retrospective cohort study at a community emergency department in Japan. We included all severely injured patients with an Injury Severity Score > 15 from January 2002 to December 2021. The primary outcome measure was in-hospital mortality. The other outcome of interest was hospital length of stay. One-to-one propensity score matching was performed to compare these outcomes between suicide attempt and no suicide attempt groups. Of the 2714 eligible patients, 183 (6.7%) had trauma caused by a suicide attempt. In the propensity score-matched analysis with 139 pairs, the suicide attempt group showed a significant increase in-hospital mortality (20.9% vs. 37.4%; odds ratio 2.27; 95% confidence intervals 1.33–3.87) compared with the no suicide attempt group. Among survivors, the median hospital length of stay was significantly longer in the suicide attempt group than that in the no suicide attempt group (9 days vs. 12 days, $p = 0.0076$). Because of the unfavorable consequences and potential need for additional healthcare, increased attention should be paid to patients with trauma caused by a suicide attempt.

Keywords: healthcare resources; prehospital length of stay; severe trauma; suicide attempt

1. Introduction

Suicide is a major public health issue worldwide. According to a report by the World Health Organization, more than 700,000 people die by suicide every year globally, accounting for more than one in every 100 deaths (1.3%) in 2019 [1]. In Japan, rates of suicide have continued to increase since the coronavirus disease pandemic [2], with >20,000 people dying by suicide in 2022 [3]. Japan had the fourth-highest suicide rate among Organization for Economic Co-operation and Development countries in 2021 [4]. Thus, suicide is a growing global concern and is a particularly urgent issue in Japan.

Among various modalities of suicide attempts, self-inflicted injury is common, and involves a substantial economic burden for society. For example, among Japanese junior and senior high-school students, approximately 10% of respondents reported at least one experience of self-injury [5]. A recent study in the United States (US) reported that the

estimated national cost of self-injury mortality rose from $0.46 trillion to $1.12 trillion over the past two decades [6].

Despite the significant societal impact of attempted suicide, studies examining the effect of suicide attempts on clinical outcomes among the trauma population are scarce [7–10]. Several studies have suggested that patients with trauma caused by a suicide attempt exhibited increased in-hospital mortality compared with those who did not, even after adjusting for potential confounders such as age, sex, vital signs, and injury severity [7,8]. However, several other studies reported no differences between the two groups [9,10]. Given these conflicting findings, the association between a suicide attempt and clinical consequences among injured patients remains unclear, and clarifying this issue will require future studies examining various settings. In addition, no previous studies examining this topic have captured relevant information, such as anatomical region; presentation time (daytime or nighttime); presentation day (weekday or weekend); need for emergency surgery; comorbidities; or diagnosed mental illness [7–10]. These variables may be important confounders.

Therefore, using our trauma database, which prospectively captures such variables, and propensity score (PS) matching analysis, which is an established method for reducing the effects of confounding factors in a retrospective study, we sought to clarify the association between a suicide attempt and clinical consequences, such as in-hospital mortality and hospital length of stay (LOS) among injured patients at a community tertiary medical center in Japan. We postulated that a suicide attempt would be independently associated with higher rates of in-hospital mortality and longer hospital stays among patients with trauma.

2. Materials and Methods

2.1. Study Design and Setting

This was a retrospective cohort study at a community emergency and critical care medical center in Japan. Annually, the emergency department (ED) receives > 5000 ambulances and >1200 trauma patients. Of these, approximately 25% are classified as having severe injury, with an Injury Severity Score (ISS) > 15. The facility is the only tertiary and referral medical center within a 50 km radius containing approximately 500,000 residents. At most tertiary hospitals in Japan, including our own, patients who have trauma caused by suicide attempts and are brought to the ED, are initially evaluated by an emergency medical team consisting of attending emergency physicians, emergency medicine residents, post-graduate year 1 or 2 junior residents, and nurses. After the initial resuscitations, a psychiatric consultation is provided by in-house psychiatrists. If patients who have attempted suicide are physically stabilized and need long-term psychiatric care, they are likely to be transferred to psychiatric hospitals.

2.2. Participants and Data Sources

After approval by the Institutional Review Board at Ohta Nishinouchi Hospital (approval no. 14_2023), all severely injured patients with ISS > 15 who were transported directly from the scene to the ED between 1 January 2002 and 31 December 2021 were recruited in this study. The board waived the need for patient consent. Patients who received ongoing cardiopulmonary resuscitation at initial contact, patients who were transported from other facilities, and pediatric patients < 15 years of age were excluded from the analysis. Trauma etiology was dichotomized into blunt (e.g., traffic accident, fall, hanging) and penetrating (e.g., stabbing, cutting) injuries. Burn injuries and patients without trauma (such as those affected by self-poisoning) were not included in our trauma database.

Data were collected from a hospital-based electronic database, which prospectively captures each patient's age; sex; comorbidities; diagnosed mental illness; initial recorded vital signs; physician-staffed ambulance dispatch; need for emergency endotracheal intubation and emergency surgery; ED presentation date and time; prehospital LOS (time from the emergency call to ED arrival); and hospital LOS (time from hospital admission to hospital discharge or transfer). A board-certified emergency physician who specialized in

trauma care (author K.S.) scored the Abbreviated Injury Scale (AIS) of each body region, the ISS [11], the Revised Trauma Score (RTS) [12], and the probability of survival using the Trauma and Injury Severity Scores method [13]. To reduce the risk of biased assessment, the author who scored these trauma parameters did not participate in any of the statistical analyses.

2.3. Exposures and Outcome Measurement

The patients were classified into suicide attempt and no suicide attempt groups. The no suicide attempt group consisted of patients who had accidental trauma, whereas the suicide attempt group consisted of those who had trauma caused by patients themselves as a result of suicidal intent. Suicide attempts were determined via self-report by the patient, police report, or circumstantial evidence, such as the presence of a suicide note. The primary outcome measure was in-hospital mortality. The other outcomes of interest were prehospital LOS, and hospital LOS among survivors. This study adopted prehospital LOS as a trauma care parameter because prolonged prehospital LOS was known to be associated with poor outcomes of injured patients [14–17]. Many previous studies similarly considered prehospital LOS to be an important parameter of trauma care [14–17]. Hospital LOS was also deemed to be a relevant care parameter reflecting increased healthcare resources and costs [7–10,18–20].

Differences in discharge disposition (psychiatric hospital transfer and long-term care facility transfer) among survivors were also compared between patients with self-inflicted injuries and those with unintentional injuries.

2.4. Statistical Analysis

A statistical analysis plan was determined a priori. Both crude and matching analyses were performed between the suicide attempt and no suicide attempt groups. Matching analysis was conducted using greedy nearest neighbor one-to-one PS matching without replacement. Multivariable logistic regression was used to find PS to predict the probability of being assigned to the self-inflicted group. In addition to age and sex, the Charlson Comorbidity Index [21,22]; diagnosed mental illness; presentation time and period (8:00–16:59, 17:00–23:59, and 24:00–7:59, weekend or weekday and 2002–2006, 2007–2011, 2012–2016, and 2017–2021, respectively); season (spring: March–May, summer: June–August, autumn: September–November, and winter: December–February); initial recorded vital signs (Glasgow Coma Scale [GCS] score; systolic blood pressure [SBP] and respiratory rate); trauma etiology (blunt or penetrating); injury distribution with AIS $\geq$ 3; and ISS were selected as explanatory variables for the logistic regression. A set of these variables was chosen a priori on the basis of previous information and biological plausibility. The ISS and AIS are widely used anatomical scoring systems that are correlated with trauma mortality and morbidity [11–13]. A high Charlson Comorbidity Index was also known to be associated with increased mortality in patients with trauma [23,24]. Therefore, these variables were incorporated into the logistic regression model to find the PS. To maximize model fitting, patients' physiological parameters including GCS score, SBP, and respiratory rate were categorized (GCS score: 3, 4–5, 6–8, 9–12, and > 12; SBP: 1–49, 50–75, 76–89, and >89 mmHg; and respiratory rate: > 29, 10–29, 6–9, 1–5, and 0 breaths/min) according to the scoring system of the RTS [12]. The Charlson Comorbidity Index was also divided into four groups (0, 1, 2, and $\geq$3). Because our study period was relatively long, the data were divided into four phases (2002–2006, 2007–2011, 2012–2016, and 2017–2021) and each phase was considered as a possible confounder. A previous report employed a similar adjustment strategy [25,26]. Mental illness, season, nighttime, and weekend admission were also incorporated into our model, as described above, because these variables are known to be associated with both suicide attempts and trauma outcomes [27–30]. All categorical variables mentioned above were dummy coded and incorporated into the PS model. The Hosmer–Lemeshow test and the c-statistic were used to confirm the goodness of fit and

discrimination ability of the models. The standardized difference (SD) was used to evaluate the covariate balance; an absolute SD of >10% represents meaningful imbalance [31].

Each patient in the suicide attempt group was matched with a patient in the no suicide attempt group, with the nearest estimated propensity on the logit scale within a specified range (0.2 of the pooled standard deviation of estimated logits) to reduce characteristic differences between the two groups. If two or more patients in the no suicide attempt group met this criterion, one patient was randomly selected for matching. The Mann–Whitney U test was used to compare the prehospital and hospital LOS between the two groups. Chi-squared tests were used to compare hospital mortality between the two groups. All statistical analyses were performed using SPSS Statistics for Windows, version 25.0 (IBM Corp., Armonk, NY, USA). A p-value of <0.05 was considered to indicate statistical significance. The violin plots were generated using GraphPad Prism 9 (GraphPad Software, San Diego, CA, USA).

2.5. Subanalysis

To evaluate the robustness of the PS-matching analysis described above, inverse probability of treatment weighting (IPTW) analysis was also conducted for hospital mortality. An unconditional logistic regression model adjusted for PS was also fitted using hospital mortality as a dependent variable.

2.6. Power Analysis

The retrospective nature of the study predetermined the sample size. The observed power was computed post hoc using G*Power 3 for Windows (Heinrich Heine University, Dusseldorf, Germany) for all primary outcomes examined.

3. Results

3.1. Participant Flow

During the study period, 24,776 trauma patients were transported to the ED, of whom 5921 (23.9%) had severe injury with ISS > 15 (Figure 1). Among them, 1630 patients who were transported from other facilities; 1097 patients < 15 years of age; and 480 patients who received ongoing cardiopulmonary resuscitation were excluded from analysis. The remaining 2714 patients were included in the crude analysis. Of these, 183 (6.7%) had trauma caused by a suicide attempt. Using one-to-one PS-matching, 139 pairs of injured patients who had attempted suicide or not were selected. Complete records were available for all patients, and no data were missing from the analyses. The c-statistic for goodness of fit was 0.92 (95% confidence interval [CI] 0.90–0.94) in the PS model, and the Hosmer–Lemeshow test verified the good fit (p = 0.945) of the PS model. Supplementary Figure S1 shows the distributions of PS in the full and matched cohorts.

3.2. Characteristics of Study Participants

Table 1 shows the characteristics of all patients (n = 2714) and PS-matched patients (n = 278). The suicide attempt group was more likely to be younger and more likely to be male. There were also statistically significant differences in vital signs such as the GCS score, SBP, and respiratory rate between the two groups. All of these physiological parameters were more severe in the suicide attempt group compared with the no suicide attempt group. Similarly, patients in the suicide attempt group were more likely to have penetrating injuries and severe injuries, with a higher ISS and a higher proportion with AIS $\geq$ 3 of the head or neck, chest, and extremities or pelvic girdle compared with patients in the no suicide attempt group. Compared with the no suicide attempt group, the suicide attempt group were more likely to present between 24:00–7:59 (35.5% vs. 18.3%) and more likely to receive emergency endotracheal intubation (58.5% vs. 25.1%). After PS-matching, patient distributions were closely balanced, with all SD < 10% between the two groups.

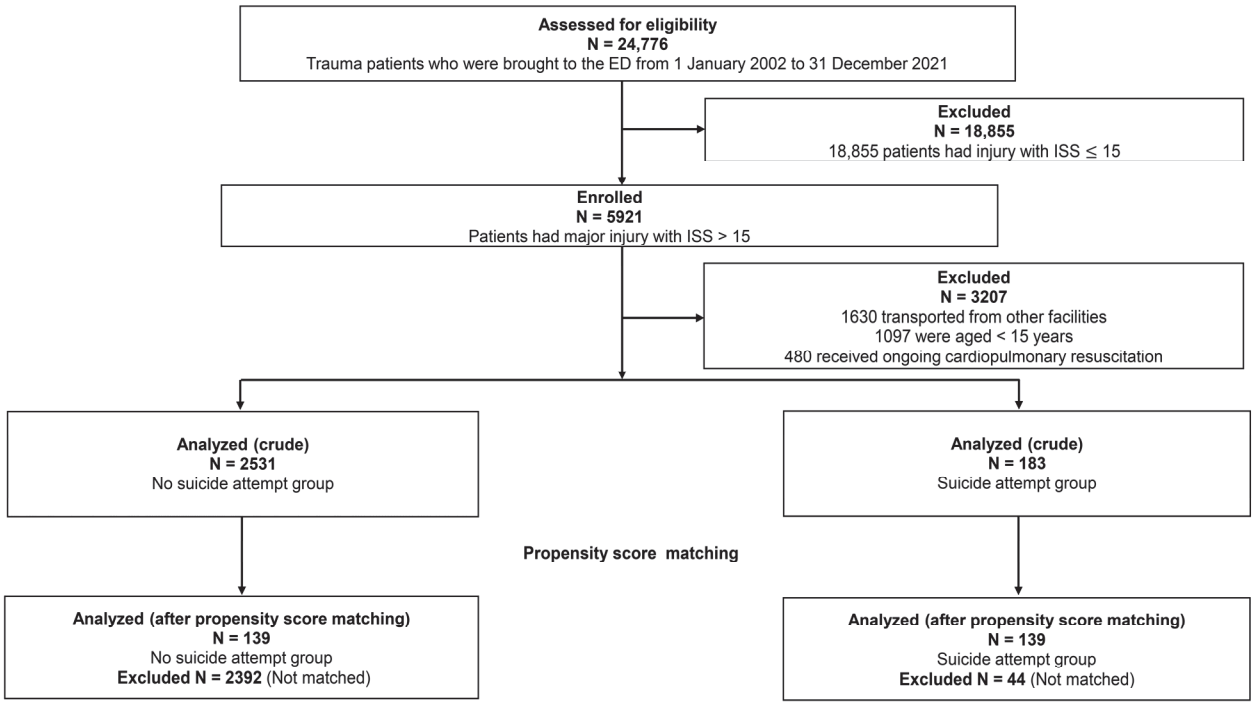

Figure 1. Flow chart showing selection process for injured patients included in analyses. ED, emergency department; ISS, Injury Severity Score.

Table 1. Demographic and clinical characteristics of injured patients: no suicide attempt group vs. suicide attempt group.

	Full Cohort				PS Matched Cohort			
	No Suicide Attempt (n = 2531)	**Suicide Attempt (n = 183)**	***p***	**SD (%)**	**No Suicide Attempt (n = 139)**	**Suicide Attempt (n = 139)**	***p***	**SD (%)**
Age								
Median (interquartile range)	63.0 (46.0–75.0)	40.0 (28.0–58.0)	<0.001	NA	46.0 (31.0–64.0)	46.0 (31.0–62.0)	0.618	NA
Mean ± standard deviation	59.2 ± 20.0	43.2 ± 18.0	<0.001	−84.1	47.2 ± 20.1	46.0 ± 18.2	0.600	−6.3
Sex			<0.001				0.805	
Male	1830 (72.3)	98 (53.6)		−39.5	87 (62.6)	85 (61.2)		−2.9
Female	701 (27.7)	85 (46.4)		39.5	52 (37.4)	54 (38.8)		2.9
Admission phase			0.142				0.974	
2002–2006	529 (20.9)	33 (18.0)		−7.3	21 (15.1)	21 (15.1)		0
2007–2011	598 (23.6) *	57 (31.1) **		16.9	40 (28.8)	43 (30.9)		4.6
2012–2016	734 (29.0)	47 (25.7)		−7.4	41 (29.5)	38 (27.3)		−4.9
2017–2021	670 (26.5)	46 (25.1)		−3.2	37 (26.6)	37 (26.6)		0
Trauma etiology			<0.001				0.642	
Blunt	2515 (99.4)	170 (92.9)		−34.3	130 (93.5)	128 (92.1)		−5.4
Penetrating	16 (0.6)	13 (7.1)		34.3	9 (6.5)	11 (7.9)		5.4
Anatomical severity								
ISS								
Median (interquartile range)	25.0 (18.0–30.0)	30.0 (24.0–45.0)	<0.001	NA	29.0 (20.0–45.0)	29.0 (22.0–41.0)	0.684	NA
Mean ± Standard Deviation	26.7 ± 10.9	35.7 ± 17.1	<0.001	62.8	33.9 ± 17.3	33.3 ± 15.0	0.739	−3.7
AIS (≥3)								
Head or neck	1489 (58.8)	52 (28.4)	<0.001	−64.4	51 (36.7)	45 (32.4)	0.449	−9.1
Face	74 (2.9)	9 (4.9)	0.130	10.3	7 (5.0)	6 (4.3)	0.776	−3.3
Chest	1402 (55.4)	122 (66.7)	0.003	23.3	99 (71.2)	95 (68.3)	0.601	−6.3
Abdomen or pelvic contents	347 (13.7)	30 (16.4)	0.311	7.6	19 (13.7)	19 (13.7)	1.000	0
Extremities or pelvic girdle	560 (22.1)	69 (37.7)	<0.001	34.6	46 (33.1)	49 (35.3)	0.704	4.6
Physiological parameters								

Table 1. *Cont.*

	Full Cohort				PS Matched Cohort			
	No Suicide Attempt (n = 2531)	**Suicide Attempt (n = 183)**	***p***	**SD (%)**	**No Suicide Attempt (n = 139)**	**Suicide Attempt (n = 139)**	***p***	**SD (%)**
GCS score			<0.001				0.980	
13–15	1811 (71.6) **	104 (56.8) *		−31.2	83 (59.7)	84 (60.4)		1.4
9–12	256 (10.1) *	36 (19.7) **		27.2	24 (17.3)	24 (17.3)		0
6–8	202 (8.0)	13 (7.1)		−3.4	8 (5.8)	10 (7.2)		5.7
4–5	102 (4.0)	9 (4.9)		4.4	7 (5.0)	6 (4.3)		−3.3
3	160 (6.3) *	21 (11.5) **		18.3	17 (12.2)	15 (10.8)		−4.4
SBP, mmHg			<0.001				0.962	
>89	2239 (88.5) **	142 (77.6) *		−29.4	110 (79.1)	113 (81.3)		5.5
76–89	114 (4.5)	12 (6.6)		9.2	11 (7.9)	9 (6.5)		−5.4
50–75	134 (5.3)	14 (7.7)		9.7	11 (7.9)	10 (7.2)		−2.6
1–49	44 (1.7) *	15 (8.2) **		30.3	7 (5.0)	7 (5.0)		0
Respiratory rate, breaths/min			<0.001				0.865	
>29	2110 (83.4) **	123 (67.2) *		−38.2	100 (71.9)	101 (72.7)		1.8
10–29	370 (14.6) *	50 (27.3) **		31.6	30 (21.6)	32 (23.0)		3.4
6–9	30 (1.2)	1 (0.5)		−7.6	2 (1.4)	1 (0.7)		−6.9
1–5	2 (0.08)	0 (0)		−4.0	0 (0)	0 (0)		0
0	19 (0.8) *	9 (4.9) **		24.8	7 (5.0)	5 (3.6)		−6.9
RTS								
Median (interquartile range)	7.841 (6.817–7.841)	7.550 (5.881–7.841)	<0.001	NA	7.550 (5.967–7.841)	7.550 (5.967–7.841)	0.598	NA
Mean ± standard deviation	7.035 ± 1.373	6.451 ± 1.961	<0.001	−34.5	6.524 ± 1.935	6.641 ± 1.834	0.303	6.2
Probability of survival								
Median (interquartile range)	0.932 (0.778–0.962)	0.918 (0.518–0.980)	0.144	NA	0.901 (0.553–0.978)	0.924 (0.695–0.981)	0.408	NA
Mean ± Standard Deviation	0.806 ± 0.265	0.725 ± 0.342	<0.001	−26.5	0.760 ± 0.333	0.766 ± 0.320	0.878	1.8
Charlson Comorbidity Index			<0.001				0.958	
0	2025 (80.0) **	108 (59.0) *		−46.8	92 (66.2)	91 (65.5)		−1.5
1	248 (9.8) *	66 (36.1) **		65.6	39 (28.1)	40 (28.8)		1.6
2	142 (5.6) **	2 (1.1) *		−25.2	3 (2.2)	2 (1.4)		−6.0
≥3	116 (4.6)	7 (3.8)		−4.0	5 (3.6)	6 (4.3)		3.6
Diagnosed mental illness	98 (3.9)	75 (41.0)	<0.001	2.2	43 (30.9)	42 (30.2)	0.896	
Presentation time			<0.001				0.924	
8:00–16:59	1292 (51.0) **	60 (32.8) *		−37.5	49 (35.3)	50 (36.0)		1.5
17:00–23:59	777 (30.7)	58 (31.7)		2.2	45 (32.4)	42 (30.2)		−4.5
24:00–7:59	462 (18.3) *	65 (35.5) **		39.5	45 (32.4)	47 (33.8)		3.2
Presentation day			0.173				0.474	
Weekdays	1818 (71.8)	140 (76.5)		10.8	29 (20.9)	34 (24.5)		8.6
Weekends	713 (28.2)	43 (23.5)		−10.8	110 (79.1)	105 (75.5)		−8.6
Season			0.292				0.999	
Spring (March–May)	625 (24.7)	54 (29.5)		10.8	38 (27.3)	39 (28.1)		1.8
Summer (June–August)	660 (26.1)	52 (28.4)		5.2	37 (26.6)	37 (26.6)		0
Autumn (September–November)	649 (25.6)	40 (21.9)		−8.7	32 (23.0)	31 (22.3)		−1.7
Winter (December–February	597 (23.6)	37 (20.2)		−8.2	32 (23.0)	32 (23.0)		0
Intervention								
Physician-staffed ambulance dispatch	945 (37.3)	79 (43.2)	0.116	12.1	63 (45.3)	61 (43.9)	0.809	−2.8
Emergency endotracheal intubation	635 (25.1)	107 (58.5)	<0.001	72.0	64 (46.0)	70 (50.4)	0.548	8.8
Emergency surgery	412 (16.3)	37 (20.2)	0.166	10.1	30 (21.6)	25 (18.0)	0.452	−9.0

Data are expressed as n (%) unless otherwise noted. ** Adjusted standardized residual > 1.96. * Adjusted standardized residual < −1.96. The *p*-values were derived from the Mann–Whitney U test or chi-squared tests. AIS, Abbreviated Injury Scale; ETI, endotracheal intubation; GCS, Glasgow Coma Scale; ISS, Injury Severity Score; NA, not available; PS, propensity score; RTS, Revised Trauma Score; SBP, systolic blood pressure; SD, standardized difference.

3.3. Primary Outcomes

Figure 2 and Supplementary Table S1 show the differences in-hospital mortality between the no suicide attempt and suicide attempt groups. In PS-matched patients, in-hospital mortality was significantly higher in the suicide attempt group (37.4% vs. 20.9%; odds ratio [OR] 2.27; 95% CI 1.33–3.87). A similar trend was observed with other statistical assumptions, such as in the logistic regression model using PS as an explanatory variable (adjusted OR 2.45; 95% CI 1.61–3.74) and IPTW analysis (OR 2.74; 95% CI 2.40–3.15).

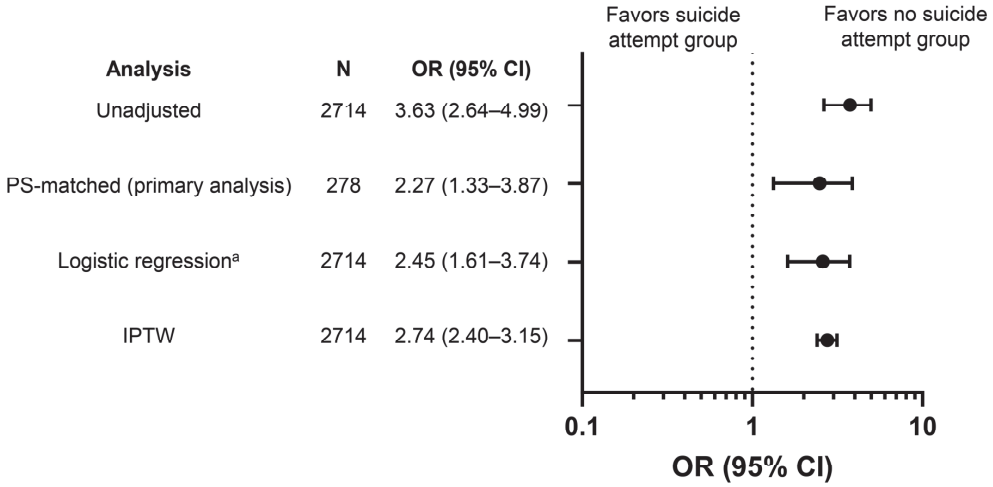

Figure 2. Odds ratios for in-hospital mortality among injured patients: no suicide attempt group vs. suicide attempt group. Reference set was the no suicide attempt group. [a] Adjustment for the PS as described in Methods. CI, confidence interval; IPTW, inverse probability of treatment weighting; OR, odds ratio; PS, propensity score.

3.4. Other Outcomes

Figure 3A,B show a comparison of prehospital LOS between the suicide attempt and no suicide attempt groups. The median duration of prehospital LOS was significantly shorter in the suicide attempt group than that in the no suicide attempt group in both crude (45.0 min vs. 52.0 min, $p = 0.003$) and PS-matched analyses (42.0 min vs. 54.0 min, $p = 0.013$). Among survivors, the median hospital LOS was significantly longer in the suicide attempt group compared with that in the no suicide attempt group in both the full cohort (14 days vs. 7 days, $p < 0.001$; Figure 3C), and the PS-matched cohort (12 days vs. 9 days, $p = 0.0076$; Figure 3D).

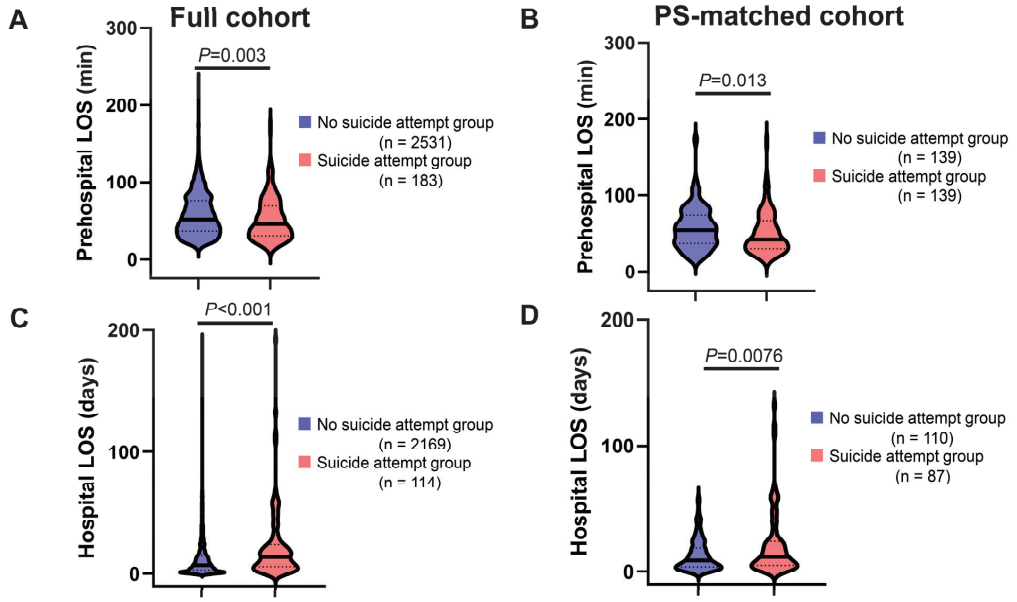

Figure 3. Prehospital and hospital LOS among injured patients: no suicide attempt group vs. suicide attempt group. (**A**,**B**) prehospital LOS in the full (**A**) and PS-matched (**B**) cohort. (**C**,**D**) hospital LOS in the full (**C**) and PS-matched (**D**) cohort. Prehospital LOS is defined as time from the emergency call to ED arrival. Hospital LOS is defined as time from hospital admission to hospital discharge or transfer. Continuous lines and dotted lines within the violin plot indicate median and quartiles, respectively. The *p*-values are derived from the Mann–Whitney U-test. LOS, length of stay; PS, propensity score.

When considering patient disposition among survivors, patients in the suicide attempt group were more likely to be transferred to psychiatric hospitals compared with patients in the no suicide attempt group, both in the full cohort and the PS-matched cohort (Supplementary Table S2). The proportion of patients who transferred to long-term care facilities was similar between the two groups, in both the full cohort and the PS-matched cohort (Supplementary Table S2).

4. Discussion

This single-site observational study revealed that a suicide attempt was associated with increased hospital mortality in patients with severe trauma. Among survivors, hospital LOS was also significantly longer in the suicide attempt group compared with the no suicide attempt group. These associations were consistent in both the full cohort and the PS-matched cohort. Our results suggest that patients with severe injury caused by a suicide attempt warrant special attention because of the increased risk of unfavorable consequences and potential need for increased healthcare resources. Thus, the current findings emphasize the importance of prevention of injury caused by suicide attempt.

Our PS-matched analysis indicated that injured patients who attempted suicide had increased hospital mortality compared with those who did not. These associations persisted in other statistical assumptions, such as the IPTW method and a logistic regression model adjusted for PS. Similar associations were also found in two previous studies in mature trauma care systems [7,8]. In Japan, a specialized trauma care system such as that in the US, has not yet been implemented. For example, most Japanese community hospitals, including our study site, do not comply with the American College of Surgeons standards for a level I [32], or even a level II, trauma center [32]. The patient population in the current study differs from those in previous studies in several ways [7–10]. For example, in previous studies, the proportion of penetrating injury ranged from 28% to 54.1% in the suicide attempt group [7,10]. In contrast, in the current analysis, the rate of penetrating injury in the suicide attempt group was much lower (7%). The current findings corroborate previous reports of an association between increased hospital mortality and suicide attempts, by demonstrating this pattern in a different patient population, geographical region, and healthcare system compared with previous studies [7–10]. Similar results were observed with different etiologies, such as self-inflicted burn injuries [33,34], supporting the robustness of the association.

There are several plausible explanations for the finding that patients with trauma caused by a suicide attempt had an increased mortality rate compared with those who did not. First, patients with a severe injury caused by a suicide attempt might be subjected to prejudice regarding their medical care [8]. For example, if a patient with trauma caused by a suicide attempt is unconscious, their close relatives may be more likely to choose to withhold or withdraw life-sustaining treatment when discussing resuscitation code status, in consideration of the patients' intention. Additionally, if a patient who attempted suicide is conscious, they may be less likely to be motivated in their recovery, and they may decline further necessary treatment and rehabilitation. Thus, it is possible that prejudice presents in a variety of ways that ultimately result in a higher mortality for patients with trauma caused by suicide attempt.

Other possible factors contributing to unfavorable outcomes in injured patients who attempted suicide may be related to differences in socioeconomic status. Patients who attempted suicide are more likely to be socially or economically poor; these characteristics are known to be associated with poor survival outcomes among patients with trauma [35, 36] and a variety of other conditions [37].

In addition to age, sex, anatomical severity, and physiological severity, the current study captured in-depth information, such as presentation time; presentation day; anatomical site; need for emergency surgery; comorbidities; and diagnosed mental illness. These variables are important potential confounders that were not adjusted for in previous stud-

ies [7–10]. We believe that this strength of our study further supports the independent association between suicide attempts and increased mortality among trauma patients.

In accord with several previous studies [7,9], the current findings indicated that hospital LOS among survivors was significantly longer in the suicide attempt group compared to the no suicide attempt group. It is plausible that social factors, such as difficulty finding a place to be discharged, played a role in this finding. For example, the patient's family or secondary hospitals without a psychiatric department may be likely to express difficulties over accepting patients who attempted suicide compared with patients who did not. The current findings also revealed that injured patients who attempted suicide were more likely to be transferred to psychiatric hospitals. Physical stabilization is generally a prerequisite for psychiatric hospital transfer in Japan, which takes a relatively long time. It is also plausible that the suicide attempt group was more likely to have psychological symptoms compared with the no suicide attempt group, the presence of which is known to be associated with prolonged hospital stay [38,39]. Previous studies have reported that prolonging hospital LOS occupies beds and caregivers for a longer time, as well as increasing healthcare costs and economic burden [40,41]. The excess length of hospital stay is also known to be associated with increased complications, such as hospital-acquired infections [42,43]. The current findings, taken together with previous reports [7,9], indicate that injured patients who attempted suicide require higher levels of healthcare resources than patients those who did not.

The current findings also revealed that prehospital LOS was shorter in the suicide attempt group compared with the no suicide attempt group. The study facility is the only emergency and critical care medical center within this medical control area, and is expected to receive physically and socially vulnerable cases. Because of this social responsibility, the self-inflicted group may have been admitted by the study facility relatively quickly.

Limitations and Strengths

Several limitations of the current study should be acknowledged. First, this study was performed at a single site, limiting the generalizability of the findings. Japanese healthcare systems are typically well organized, with minimal variations of sociodemographic conditions across regions [33]. Therefore, it may not be possible to extrapolate our findings to other medical institutions, particularly those in an underdeveloped social environment.

Second, although rigorous adjustments were made in the PS-matched analysis, other unmeasured factors may have confounded our results, as with any observational study. For example, several important covariates, such as distance to the scene, fluid resuscitation, social status, insurance status, and use of vasopressors, were not captured in our database. In addition, although alcohol or psychoactive drug use at the time of the injury can affect the trauma outcome [44,45], our database did not record these variables. Furthermore, although our database captured the time from the emergency call to ED arrival (prehospital LOS), the time from injury occurrence to emergency call was not recorded. Accidental injury is likely to occur in public places, and ambulances are likely to be called immediately by bystanders or patients by themselves. In contrast, a suicide attempt is less likely to occur in a public place, and less likely to be witnessed by bystanders. It is also possible that patients who attempted suicide exhibit hesitation regarding calling ambulances. Such delays may have been present but were not reflected in our outcome measures. Further analyses including these variables will be needed to further clarify the association between injuries caused by suicide attempt and measured clinical outcomes.

Third, it is possible that there were missed or misclassified suicide attempts. We speculate that suicide attempts may have been underestimated because some injured patients may have concealed their attempted suicide. This could have potentially biased our results toward the null hypothesis.

Finally, the sample size was relatively small, and was not determined a priori. As described in the Methods, because of the retrospective nature of the current study, it was not possible to predetermine the sample size. Nevertheless, a post-hoc power calcula-

tion indicated that the power in our study was sufficient (power > 0.80) for all primary outcomes examined.

Despite these limitations, the current study had several strengths. First, there were no missing data for all relevant analyses, maximizing the quality of PS-matched analysis. The measured outcomes were objective (i.e., hospital mortality and hospital LOS) and less prone to diagnostic errors. Furthermore, to mitigate the risk of biased assessment, the author who constructed the database (K.S.) was not involved in the any of the statistical analysis. Therefore, we believe that the current study accurately delineated the impact of injury caused by attempted suicide on mortality and use of medical resources in a typical Japanese ED.

5. Conclusions

At a community tertiary hospital in Japan, injuries caused by suicide attempts were independently associated with increased mortality compared with other types of injuries. Among survivors, hospital LOS was also significantly longer in trauma patients who attempted suicide compared with those who did not. Increased attention should be paid to this subset of trauma patients regardless of demographic characteristics or severity of injury, because of the more severe consequences and the potential need for additional healthcare resources.

Supplementary Materials: The following supporting information can be downloaded at: https://www.mdpi.com/article/10.3390/ijerph21020121/s1, Figure S1. Distribution of propensity score in the full (A) and propensity score-matched (B) cohorts. Table S1. Comparison of mortality rate: no suicide attempt group vs. suicide attempt group. Table S2. Disposition location among survivors: no suicide attempt group vs. suicide attempt group. Data S1. The minimal anonymous dataset used in this study.

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Institutional Review Board Statement: The Institutional Review Board at Ohta Nishinouchi Hospital approved this study (approval no. 14_2023) in September 2023. The study was performed in accordance with the ethical standards as laid down in the 1964 Declaration of Helsinki and its later amendments, or comparable ethical standards.

Informed Consent Statement: The Institutional Review Board at Ohta Nishinouchi Hospital waived the need for patient consent because the study was not randomized and assessed the clinical outcomes of routine practices.

Data Availability Statement: The minimal anonymous dataset used in this study is included in Supplementary Data S1 in the Supporting Information File.

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Conflicts of Interest: The authors have no conflicts of interest to declare.

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Pathways to Suicide among Police in Rajasthan: Perceptions and Experiences of Police Personnel

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Abstract: *Background*: Evidence regarding the experience and perceptions of police personnel with suicide in South Asia is limited. This study explored the lived experiences and perceptions of suicide among police personnel in an Indian state. The focus was on explanations of and reasons for suicide. *Methods*: We conducted 20 qualitative interviews in 2021 with police of different ranks, guided by a topic guide. The reflexive thematic analysis approach was supported by the use of NVivo 12, a qualitative software package. *Results*: We explore three intersecting key themes around suicide in the police force, including: (1) the stressful police environment; (2) expectations of mental strength; and (3) police image and help-seeking. We discuss the tensions between these themes and how to address the challenges of supporting police personnel. *Conclusions*: To support and improve police personnel's mental well-being training and support are needed but also broader changes at the organisational level. These need to take social and historical factors into account. An increased level of suicide and mental health literacy will not only benefit the police force but also the general public, and it would be very timely with recent changes in the Indian mental health and suicide policy context.

Keywords: police suicide; police service; India; organisational factors; occupational factors

1. Introduction

Research from around the world suggests that the police are among the occupations at the highest risk for suicide, although evidence from South Asia is sparse [1]. In addition, the importance of the police in Asia and the Pacific as a key stakeholder in suicide research and prevention has been pointed out as early as 2010 [2].

Estimating suicide rates for police personnel is challenging due to a number of factors, including inconsistencies in reporting and a likelihood of underreporting [3]. Earlier research suggested that casualty rates for Indian police officers are some of the highest in the world [4]. There is a lack of current suicide statistics available for police personnel in India. Nathanael [5] suggested that between 2013–15, over 940 police personnel killed themselves in India. A recent report [6] on the Indian police found that the force is understaffed and under resourced, while at the same time crime rates have risen, making it a stressful environment to work in.

More recently, it has been argued that aiming to classify suicide rates for police personnel is unproductive and that a better understanding of risk factors and pathways to suicidal behaviours is essential for suicide prevention in the police force [3,7]. Krishnan and colleagues [3], in a systematic review, identified five risk factors that increase the likelihood of suicide, including "problematic substance use close to, or at the time of death; presence of depression and previous suicide attempts; differences in trauma response; exposure to excessive and prolonged job-related stress, including dissatisfaction; absence of a stable intimate relationship" (p. 939). Importantly, the effects of the risk factors are cumulative. None of the studies reviewed were from India, and only a few were from South Asia.

In a ground-breaking approach, Hart and colleagues [8], working with Australian police, showed that the experience of well-being is linked to organisational and operational factors. They confirmed distinct negative and positive organisational and operational factors. Shift work and working with victims of crime are examples of operational factors; this includes demands that one would expect when working in the police. In contrast, organisational factors include more strategic and managerial issues such as bureaucracy, supervision, and resource allocation. Analysis showed that, contrary to previous assumptions [9,10], organisational, rather than operational pressures contributed to low well-being. In other words, although work itself may be difficult, it is the organisational context that determines levels of well-being. This was confirmed in a subsequent paper [11]. They also emphasised the importance of individual issues.

Singh and colleagues [12] measured very high self-reported stress levels among a sample of police personnel in India. They found that good social support and adaptive coping strategies reduced the adverse effects of work stress. A stressful police environment can lead to health problems, including increased use of alcohol or drugs and more frequent suicidal thoughts [4,13]. The importance of considering the role of occupational stress and mental health in uniformed police has recently been highlighted in a special issue of the Indian Police Journal [14]. Di Nota and colleagues [7], working with Canadian police officers, proposed that several factors need to come together over time for suicide to happen. A police officer experiences hopelessness (which could be due to a number of issues) and lacks meaningful relationships while at the same time having the impetus and capacity to put a plan into action.

Overall, most research focuses on police forces in developed countries in the West, and the research is overwhelmingly quantitative. There is very little qualitative research with police personnel in India and South Asia on their perceptions around suicide and their support and training needs. Thus, this qualitative study explored the perceptions of police suicide in a sample of Rajasthan police personnel.

2. Materials and Methods

The data presented here draws on 20 interviews conducted with police personnel in Rajasthan, India, in 2021. The data set is part of the larger South Asia Self Harm Initiative (SASHI), a Global Challenges Research-funded project.

2.1. Setting

India's justice and mental health systems are heavily influenced by the British. The present form of Indian policing is mainly based on the Police Act of 1861, which was introduced by the British and based on British-style policing. The act outlined the main functions of the police as maintaining law and order, preventing crime, surveilling, and controlling citizens [15]. The aim was to control the population and suppress dissenting voices. It has been argued that as part of this colonial legacy, current-day policing in India is still more focused on protecting the government and elite individuals' interests than promoting democratic principles [16]

India is a republic made up of 29 states and eight union territories (https://knowindia.india.gov.in/states-uts/, accessed on 6 December 2022). Although the Indian Police Service (IPS) is the principal policing agency in India, the main responsibility of policing lies with the state police and union territory agencies. The Indian Federal Government appoints and trains all IPS officers (senior and high-level police administrators), but most of the police personnel are recruited and trained by state agencies [17]. The Indian police structure is based on a military hierarchical style, which includes rigid pay scales and promotion schedules and no guaranteed leave [18]. The Home Ministry has financial, organisational, and political control at the federal and state levels [4]. The public image of the police tends to be poor, with suggestions of corruption and a perception that the police protect governments rather than individual citizens [16,19]. With its great diversity, colonial past, and political challenges, policing in India is demanding. The police tend to be understaffed, working

long hours, and their relationships with the public are often fractious [19]. Constables make up much of the workforce, but their pay is low.

Mental health law in India was institutionalised by the British with the introduction of the lunacy acts in 1858. This was replaced in 1912 by the Indian Lunacy Act of 1912—both were modelled on British laws and reflected the attitudes towards people with mental health illness at the time. The laws included a focus on containment and a bio-medical treatment model based on Western values [20]. Suicide was a criminal offence and only decriminalised recently in India, in 2018. The new mental health legislation, the Mental Healthcare Act, 2017 [21], which commenced on 29 May 2018. The 2017 Act states that "any person who attempts to commit suicide shall be presumed, unless proved otherwise, to have severe stress and shall not be tried and punished" (Section 115(1)). Police officers are expected to play an important role in relation to people who have self-harmed or attempted suicide in a range of ways, including taking a person believed to have a mental illness or be a risk to themselves into protection [21] S100 and S306. The act also highlights that "the appropriate Government officials including police officers and other officers of the appropriate Government are given periodic sensitisation and awareness training on the issues under this Act". (Chapter 4, p. 15). The role of the police in terms of suicide and self-harm prevention and dealing with families and communities has been highlighted in some countries (e.g., the UK), but implementation can be challenging [22].

2.2. Sampling and Recruitment

Sampling was purposive, and we aimed to select participants from a range of ranks to gain insight into strategic and practise experiences and thinking. There is a smaller sampling pool for the higher ranks. To ensure confidentiality, we have categorised Inspector Generals of Police, Superintendents, Deputy Commissioners of Police as high-ranking, Head Constables, Circle Inspectors, Sub Inspectors, and Assistance Sub Inspectors as mid-ranking, and Constables as low-ranking.

Participants were identified through the Rajasthan Police Academy on behalf of the research team. The academy created a list of potential participants and sent bilingual information leaflets and consent forms (English and Hindi) by email. Interested individuals returned the signed consent form directly to the local contact (second author), and an interview was arranged at a convenient time. Participants were interviewed by the second and third authors in Hindi, the principal language of Rajasthan. Interviews were conducted by telephone or Zoom, and all were recorded with participants' permission. We conducted 20 interviews with police personnel (see Table 1).

Table 1. Summary of participants demographics.

Demographic Information (n = 20)	
Age	Range 28–57 Mean 39 years
Group	High-ranking (5) - 3 females - 2 males Mid-ranking (8) - 6 females - 2 males Low-ranking (7) - 2 females - 5 males
Length in current post	7 months to 7 years

Not all participants were asked their religion; those that were identified themselves as Hindu (n = 14).

2.3. Data Collection and Analysis

A semi-structured interview guide was used, focusing on questions about experiences with suicide and self-harm, challenges in responding to suicide and self-harm, and training and support needs. The guide was developed based on a literature review [3,8,14,22,23], the research question, and our interest in the topic. The second and third authors especially highlighted the importance of considering suicide within the police force. Interviews were conducted by the second and third authors in Hindi and lasted between 30–90 min. Recordings were transcribed, anonymised, and translated as soon as possible. Transcribed data was analysed using a reflective thematic approach [24] in NVivo 12 (a qualitative data analysis package). We used a critical realism ontology as it acknowledges different perspectives and interpretations of reality that are influenced by language, culture, and social structures. Critical realism allowed us to focus on the lived experiences of participants while also considering how some of the socio-cultural and policy aspects constrain and afford opportunities to participants [25]. This includes taboos and stigma around self-harm and recent changes in the legislation surrounding self-harm and mental health. Reflective thematic analysis is an interpretive approach focused on capturing a "core idea or meaning (what is shared and unites the observations in the theme is meaning), and the telling of an interpretative story about it" [26] (p. 2). Codes are constructed by the researchers interacting with the data and bringing their own experiences and backgrounds to the analysis process. The approach is suited to research aiming to understand people's experiences and perceptions of a particular phenomenon in the contexts in which they occur [24].

The first author read and reread interview transcripts to develop themes that captured patterns and complexities. Initial codes were constructed, discussed with the second and third authors, and revisited iteratively, identifying semantic and latent codes. We used the concepts of organisational and operational factors as introduced by Hart and colleagues [8] to inform the categorisation of reasons given for suicide. Codes were clustered to find the final themes. Data were analysed within and across transcripts to identify patterns and check for inconsistencies and unusual experiences. The final codes were developed in consultation with the second and third authors. Findings were taken back to senior staff in the Rajasthan Police Academy for reflections and elaborations of the findings, a practise called Member Reflections by Tracey [27]. Members in this context are members of the police with experience in the field and as educators and trainers. This ensured that the research was more meaningful and had practical application.

To ensure anonymity, data extractions are only tagged with participants' rank (high, mid, or low) and gender. Omitted data is represented by "[. . .]". The study had ethical approval from the University of Manchester Ethics Committee. The Rajasthan Police Academy also reviewed and approved the research study.

3. Findings

We identified three main interlinking themes.

3.1. "It's Such a Stressful Job"—The Police Organisational Environment Taking Its Toll

Participants made sense of suicide and self-harm in the police by highlighting the challenges encountered in a police job. However, participants moved on to emphasise how these challenges linked to challenges experienced in people's personal lives. Over time, this can lead to stress and hopelessness, resulting in police staff killing themselves. We have categorised work-related challenges into occupational, organisational, and individual factors (informed by [11]). Organisational challenges were mentioned overwhelmingly as the main causes of stress; in terms of occupational challenges, a high workload was the most important issue.

Table 2 provides a list of challenges mentioned by participants. Similar to previous work, participants mentioned organisational factors far more frequently than occupational

challenges. It has been suggested that police can deal with occupational challenges better as these are "part of the job" and can be expected, e.g., [3,11].

Table 2. Challenges experienced by police staff.

Occupational challenges
• Distressing work experiences impacting on mental health
• Not enough sleep
• Stressful job with lots of pressures
• Over-burdened with work
Organisational challenges
• Recruiting over-qualified people as constable who are then dissatisfied
• Poor pay structure
• Grievances not dealt with appropriately
• Humiliation by other officers
• Urgent requests for leave not granted
• Shortage of manpower resulting in lots of overtime
• Lack of resources
• Allegations against officers
• Postings far away from family
• Work environment not being supportive
• Lack of support and interest by higher officers
• No union on police up to inspector level
Individual challenges in a family context
• Debt and poverty
• Societal changes–e.g., change from extended families to nuclear families; more individualistic focus
• Relationship issues and family reasons (e.g., attraction to a colleague, being away from home a lot, not able to share childcare)
• Women experiencing domestic violence
• Drug or alcohol addiction

Participants tended to talk about the suicide of police staff in relation to high levels of stress; some called it mental stress. The following quote illustrates the link between work stress and occupational and organisational factors. The participant was talking about stress as a reason for suicide in the police:

> *Very important part, I would say experience, during my eight years of posting, is, because it is such a stressful job because you don't have fixed hours of working, and*

because there is shortage of manpower, the manpower we have is overburdened with work. (High-ranking, female)

The following quote highlights the importance of working conditions and working relationships:

Self-harm in police organizations is mostly on the lines where the working conditions are not good, where the professional relations between the subordinate and the superior is not good. (Low-ranking, male)

Some participants specially highlighted tensions between senior and lower ranks and also tensions between different groups within a department, as can be seen in the following two quotes: "Police officers should treat lower staff just like human being not like machines. Police officers should change their attitude towards lower staff." (High-ranking, male) and:

The revengeful attitude of the seniors works like anything in Police Department Sir because transfer and backbiting are the biggest issues. There are several groups within the organization who connives against one another, and as a result, some people get transferred and there starts the concept of revenge, not in terms of fighting. Many are unable to bear this stress. (Low-ranking, male)

Occupational challenges when working with victims and their families and communities were not mentioned by participants when trying to explain why police staff may kill themselves; the following quote is an exception:

Here are lot of situations where I've encountered 3–5 suicides committed by the family, by the friends or by the lovers, but that really create huge mental mark on the psyche of the police officer, too. (High-ranking, male)

Generally, the work with victims and their families might be described as difficult at times, but not as something that leads police personnel to kill themselves. Most participants talked about suicide as a result of organisational challenges having an impact on people's personal lives, as the following quote illustrates:

In the police force, working conditions are poor. They have long working hours, have difficulty in getting leave when they need them, their families have expectations that they are unable to meet. Their pay is very little. They don't spend much time with their families. (high-ranking, female)

Job demands such as working away from home can leave staff feeling lonely or cut off from their family and also result in conflict and tension, which in turn can lead to suicidal actions:

In my view family factors plays a definite role in cases of self-harm. Few months back an IAS [Indian Administrative Service] officer did suicide in front of train and the reason was familial. I can't say that reasons are never professional but in most of the cases reasons are related to family and mostly due to lack of understanding. (Mid-ranking, female)

What these quotes show is that negative occupational and organisational factors can negatively impact family relationships over time.

3.2. 'You Have to Be Mentally Strong'—How to Cope with the Police Role

Participants seemed to try and distance themselves from the idea that police staff who commit suicide are weak or unable to cope. As shown above, the suicide of police staff was generally framed as a result of work and organisational factors impacting family and community relationships. This came across as an understandable outcome due to external pressures beyond the person's control.

All participants indicated that society would see suicide as a sign of weakness, not being able to cope with the stresses and strains of life and work:

People who commit such episodes of self-harm, society consider them as weak. Society does not justify them. People think what is the need of suicide, he must be-a weak person. He has to manage all the situations but what is the need of suicide. He is not a fighter.

Society thinks that he is a third-class person. He is a weak person, can't afford stress. (Mid-ranking, male)

Very few phrased it to indicate that they personally agreed with this point of view. As mentioned earlier, most participants talked about suicide in terms of stress or mental distress but far less in terms of mental illness. The following quote is an exception, referring to people with existing mental health conditions who enter the police and then struggle with the requirements of the role:

Psychiatric cases are another challenge with the uniform forces. People who are psychiatric cases do enrol in police forces and get into the permanent job after initial two to three years. (High-ranking, male)

Rather than talking about weakness in relation to police staff, the need to be strong was highlighted as an essential characteristic for the police role:

Somebody who's mentally strong is needed in this profession because if you are not mentally strong then that is the biggest self-harm that you can do to yourself. (High-ranking, female)

Research in Western countries suggests that the police culture is one of masculinity, independence, and emotional control, where it is difficult to ask for help [28]. Equally, Thakre and colleagues [29] outline how Indian police staff are expected to be tough, brave, and resilient, and that mental health illness is seen as a weakness.

Alcohol and drugs were framed as coping mechanisms, albeit destructive ones:

. . . because it is such a stressful job because you don't have fixed hours of working, and because there is shortage of manpower [. . .] so, the tendency to getting addicted to liquor or drugs is very common in police force. (High-ranking, female)

Longer-term use of alcohol and drugs was linked to domestic abuse and debts by several participants:

In my view, police personnel due to excessive stress end up taking alcohol as a way of relief, this then leads to arguments in the family and domestic abuse. (High-ranking, female)

This indicates that the long-term requirement for strength negatively impacts their ability to cope or ask for help. Although it has been suggested that people entering the police force are more likely to be mentally robust and well-prepared in comparison to the general population [3], a recent systematic review concluded that police personnel have higher levels of depression (14.6% vs. 3.8%), suicidal ideation (9.2% vs. 3.3%), and hazardous drinking (25.7% vs. 16.6%) compared to the general UK population [30].

3.3. 'Police Demands a Certain Image'—Help-Seeking Opportunities Need to Be Flexible

The importance of mental strength and the ability to cope when working in the police force means that police staff are less likely to ask for help. The police role comes with certain values and expectations. Participants suggested that if a member of the police is unable to uphold this image, linked to perceptions of losing respect, it may lead to suicide:

People bound in their social image and then something happened they thought that my social image will drop down and what people think about me. The major stress is at this time that what people think about me, what will society think about me? (Mid-ranking, male)

In a police context, challenges to one's image tend to be linked to experiences of allegations and complaints:

In some cases, people are very image conscious and that lead to mental stress also. Allegations are very common in police job. [. . .] This leads to mental stress and ultimately suicide. (Mid-ranking, male)

Seeking help is generally seen as shameful and indicates that one is unable to cope:

The person with suicidal tendency is also mentally weak as compared to a normal person. In our Indian society if any person is suffering from mental stress or I can say depression,

and he went to the psychiatrist for help then the colleagues or other persons say that he must be mad, mental or fool that's why he is going to psychiatrist. This is also a big social taboo in society. (Mid-ranking, female)

This is even more so in the case of the police:

If this event [self-harm] has happened within the department, people brand that person as nobody should talk to him. It is like tarnishing his image further. Rather, there are chances that he will go further depressed. (High-ranking, male)

Acts of repeated self-harm are linked to suicide [31]. However, as one of the participants pointed out, it is unlikely that people will report self-harm in the workplace:

Yes, we do come across self-harm and suicides among [. . .] police staff [. . .]. But the harm is hardly reported means if somebody is harmed and it doesn't lead to suicide, very rarely it is reported. (High-ranking, male)

Seven participants talked about someone they knew in the police force who killed themselves. They portrayed this as a shock, again highlighting how unlikely it is for staff to ask for help or share their difficulties with others:

Sometimes there is no obvious reason for suicide so we have to search reason. This is such a tragedy that many a times we cannot believe on it. One such incidence happened to me when one of my colleague committed suicide at the age of 54. (Mid-ranking, male)

Only a few participants highlighted the need to address negative attitudes towards suicide and mental health within the police force:

People who join the police force are after all belong to the same community, it's not that they have arrived from different planet. In that people who join police force held views and prejudices that they carry on holding which is a big challenge for us. (High-ranking, female)

The negative influence of British rule and colonialism on current policing was only mentioned by two participants. In particular, they saw this working climate creating a negative impact on staff relationships and the ability to ask for help and support: "Just like British Rule, 'yes sir' 'no sir' type of things are still prevailing here." (Low-ranking, male)

In addition, these colonial rules were also described as responsible for some of the poor working conditions:

We can't make a union from constable to sub- inspector level. We don't get childcare leaves in police department. Even government announced that but we cannot take leaves in police department. Our police department run on British rule. (Mid-ranking, female)

The Indian police largely maintained the colonial structures and rules. As mentioned earlier, these hierarchical, rigid structures restrict promotion schedules and leave and have resulted in poor pay for lower ranks [18]. A need to address challenging working conditions and, in particular, the level of workload and ability to take leave were strongly highlighted. Evidence from India suggests that police personnel may not ask for help for fear of job sanctions, stigmatisation, and missed job opportunities [32]. Indeed, feedback from participants indicated that opportunities to discuss issues are not taken up. The following quote is about a helpline for police staff that does not allow the caller to remain anonymous:

They are still hesitant in calling. From a force of around 2500 men personnel under me, I would be receiving one call in 20 days, which is very less, I think. They should call more, but that system of breaking the hierarchy or comfort level maybe is not there. (High-ranking, female)

Some participants mentioned existing independent support options, and several highlighted the need to offer support that maintains confidentiality and anonymity:

You will have to open and come out. It should be like you don't have to disclose your name [. . .] so it has to be the anonymous thing. Confidential anonymous because we have to address the shame first. (High-ranking, female)

We asked participants if they were aware that suicide had been decriminalised, and half indicated that they had been unaware. This is of concern as it may contribute to staff's reluctance to disclose difficulties and ask for help. Unfortunately, none of the participants talked further about what influence the interpretation of the law may have on police personnel. Previous research has shown that where suicide is criminalised, people are unlikely to seek help, and the act is more likely to be stigmatised [31,33].

In addition to anonymous helplines and support, training on mental health issues and how to look after one's own psychological well-being and a better understanding of self-harm and suicide were requested. The importance of good communication and listening skills for police personnel was highlighted as being beneficial, not only when working with the general public but also when dealing with colleagues, and in particular for police in leadership roles.

4. Discussion

This qualitative study shows how police personnel make sense of suicide in the police force based on negative interactions between the work environment, personal factors, and the family context. Findings are in line with other research, showing that organisational factors play a major role as well as high workload, an occupational factor [9,34]. Lack of leave, another factor highlighted here and in other studies with Indian police, is rarely considered in research in other countries. Research in Western countries has highlighted that mandatory holiday shifts, which prevent police personnel from participating in celebrations with family and friends, have a negative impact on staff well-being and family relationships [35]. Examples of the physical and psychological effects associated with overwork in the police force in China and the US include, amongst others, cardiovascular disease, diabetes, hypertension, depression, anxiety, and suicide [36]. These findings, together with the findings from the present study, underscore the importance of providing sufficient and timely leave. Positive steps are being taken in some Indian states, with an increase in the number of leave days in a year [37].

Suicide is described as more likely due to external pressures building up over time. Working in the police is linked to a specific image and expectations, which do not allow for weaknesses and inhibit help-seeking. This may be coupled with stigma attached to mental illness and suicide. A recent study by Weiss and Parkar [38] in India with people who had self-harmed or tried to kill themselves highlighted the importance of focusing on self-harm and suicide prevention rather than mental health. A mental health illness label was described as more stigmatising than self-harm or an attempt to complete suicide. They concluded that efforts to encourage help seeking should frame reasons for suicide and self-harm as based on social and structural features rather than mental health illness, which is what participants in the current study have focused on. These findings underscore the importance of considering cultural and local contexts.

The historical and colonial context plays a very important role here, as it shaped the development and set-up of the police force as well as the understanding and treatment of mental ill health [39,40]. In addition to colonial values, social values have influenced policing structures and resulted in a patriarchal, hierarchical, and authoritarian work force. Positive organisational culture, climate, and leadership are invaluable [34]. Nuttman-Shwartz and colleagues [41] originally showed, in a random sample of the Israeli population, that how an individual views suicide is influenced by their perceptions of how the public views and judges suicide. In other words, how suicide is framed and talked about by the wider population impacts an individual considering suicide and/or help-seeking and how completed suicides are talked about. Similarly, research with the Australian police force has shown that just the perception that help-seeking indicates weakness or might interfere with job prospects can prohibit help-seeking. This is the case even when organisations aim to provide mental health support [42]. Perceptions around suicide need to be addressed at the policy and welfare levels, and the recently published Indian suicide strategy is a step forward [43].

Recent developments provide major opportunities for India with the introduction of the Mental Health Act 2017 [21], which puts a focus on patients and their families and aligns with the principles of human rights as enunciated in the United Nations Convention on Persons with Disabilities (UNCRPD) and the National Suicide Prevention Strategy [43], which focuses on reducing the stigma around suicide and working with key stakeholders. Our study suggests that how suicide and self-harm are experienced and talked about in the police force has important implications not only for suicide prevention and interventions at the force level. It can inform the gatekeeping role of police in suicide prevention in the general public. This is essential, as the Indian Mental Health Act 2017 [21] expects the police to take a more active role.

Based on their systematic review of initiatives in the Asia-Pacific region, Pothakool and Meethiam [44] recommend that "police agencies develop training and engage in collaborative engagement with a range of health and community stakeholders to evolve police officers' views towards a public health perspective in relation to policing activities" (p. s23). They argue that this would allow to address issues such as mental ill-health, suicide, and harm more effectively. These activities would need to be underpinned by community policing principles, trust between the police and the community, and sufficient resources.

The current study has some limitations. It is a small qualitative study focusing on one Indian state. However, we have managed to recruit participants from a hard-to-reach and busy professional group whose opinions and behaviours can have a significant impact on suicide prevention, not only in the force but also in the general public. Our study starts to address the need for a more in-depth understanding of the challenges police officers experience in South Asia. Suicide and mental health in the police force are very sensitive topics and a qualitative approach is most appropriate. Further research with other key stakeholders, such as prison officers and families of police personnel, would be helpful in informing suicide prevention.

Our findings have implications for practise and policy. Importantly, they highlight that action needs to move beyond an individual focus to address organizational, institutional, and societal factors. Increased suicide and mental health literacy will be helpful in improving attitudes, skills, and knowledge when dealing with one's own and colleagues. It will also increase confidence and skills when dealing with the public. However, approaches need to take the local and country-wide context into account and not only focus on the police force but also address perceptions around suicide in the wider population. Improvements in working conditions and organisational structures need to be addressed at the state and country levels.

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Article

Understanding Aotearoa New Zealand University Students Intentions to Seek Help If Experiencing Mental Distress: A Comparison of Naturalistic and Interventional Findings

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Abstract: University students globally are consistently identified as a vulnerable group for mental distress and suicide. Despite this, students report low engagement in help-seeking behaviours. This series of studies aimed to assess barriers to help-seeking for students and the impact of an intervention that sought to increase support-seeking intentions. In Study 1, 373 undergraduate psychology students completed items related to depression, anxiety, suicidal ideation, stigma, and help-seeking intentions. In Study 2, 133 undergraduate psychology students were randomly allocated into one of three intervention groups (control, infographic, video) and completed measures as used in Study 1. Despite experiencing clinically relevant symptoms and recent suicidal ideation, students in Study 1 tended to report low intentionality to seek help, citing perceptions that their distress was not serious enough or a desire to handle their issues independently. In Study 2, an infographic about different support services increased student's intentions to access support services and reduced their perception that their issues were not serious enough. Overall, Aotearoa New Zealand students endorsed similar barriers to help-seeking as students in other countries. Importantly, we demonstrated that a simple infographic intervention reduced perceptions regarding these common barriers and may increase students' knowledge about when to seek help.

Keywords: mental distress; help-seeking barriers; suicidal ideation; university students

1. Introduction

Recent data from the World Health Organization (WHO) World Mental Health Surveys International College Student Project has provided important insights into students' attitudes towards help-seeking and the barriers they perceive to seeking treatment. Of particular concern, first-year university students worldwide have low engagement with support services [1] and are hesitant to seek support for emotional distress, including suicidal ideation [2]. For example, in a large cross-national survey (n = 9939), only 24.6% of students reported that they would definitely seek support for mental distress, with many citing reasons such as a *"preference to handle the problem alone"* and a desire to *"talk with friends or relatives instead"* [2]. These low levels of engagement with support services are coupled with consistent evidence that student populations are a vulnerable group for mental distress and suicide, with estimates that approximately 34.9% of first-year students struggle with at least one mental disorder [3], and 17.2% experience suicidal ideation [4].

Beyond cross-sectional, descriptive analyses, it is important to consider (a) longitudinal designs that test whether student's help-seeking attitudes and behaviours naturally shift over time and (b) experimental designs that test interventions developed to positively

shift student's attitudes and behaviours towards seeking help. To date, while intervention studies have shown promise at increasing mental health literacy and positive shifts in attitudes towards help-seeking [5,6], they have had limited effect on increasing the likelihood of engagement in help-seeking behaviours [5]. For example, one recent study developed a mental health promotion video and brochure which aimed to increase mental health knowledge and attitudes toward help-seeking among students [5]. The video and brochure provided information on mental illness, strategies for self-help, and encouraged help-seeking when experiencing distress. While the video and brochure increased mental health knowledge, there was little evidence it influenced help-seeking behaviour. Given this, more work is needed to develop mental-health promotion tools that not only increase mental health knowledge but also have a clear impact on help-seeking for students.

2. The Current Studies

The aim of the current studies was to investigate barriers to help-seeking in students in Aotearoa New Zealand. In Study 1, we assessed barriers to help-seeking and, extending previous research, used a longitudinal design to test for changes to barriers to help-seeking over a one-year period. In Study 2, we trialled two approaches to reduce these barriers to help-seeking using a short mental-health promotion video and infographic that briefly covers the main support services available locally to university students.

3. Study 1

3.1. Method

3.1.1. Participants

Participants were 373 undergraduate psychology students enrolled at a large, campus-based university in Aotearoa New Zealand. Students were relatively evenly split between their first (n = 207) and second (n = 166) year of study. Participants were between the ages of 18–25 years old (Mean (M) = 19.59, Standard Deviation (SD) = 1.18) and predominantly identified as female (n = 313; 60 males, one non-binary). The majority of the participants self-identified as New Zealand European only (75.87%; n = 283), followed by Māori (n = 21), Pasifika (n = 8), and Asian (n = 38). Twenty-one (5.63%) stated specific ethnicities which generally fell into other European regions meaning 79.09% were White.

One hundred and eighty-one participants (48.5%) completed the follow-up survey. Again, the majority were female (n = 155, 85.6%; n = 25 male, n = 1 non-binary) and identified as New Zealand European only (n = 144, 79%), followed by Māori (n = 12), Pasifika (n = 3), and Asian (n = 16). Four (2.21%) stated specific ethnicities which generally fell into other European regions. Finally, 92 (50.8%) were now in their second year while 89 (49.2%) were in their third year.

3.1.2. Procedure

This study was approved by the host university Ethics Committee (H20/029). Undergraduate students taking a first- or second-year psychology paper were invited to participate for course credit related to learning about research; students take undergraduate psychology papers from several majors across science and arts. Students who expressed interest in participating were emailed about the study and, if they chose to participate, were asked to complete a brief online survey through Qualtrics. Electronic consent was obtained, and every student was given the contact details for the research team, the student health facility, and emergency psychiatric services, in addition to a list of other support services and telephone helplines. A second follow-up survey was sent to students approximately one year later which contained the same items and information.

3.1.3. Measures

Demographic. Participants completed a questionnaire on general demographic information such as age, ethnicity, and gender.

Suicidal Ideation. The item "thoughts that you would be better off dead or hurting yourself in some way" from the Patient Health Questionnaire-9 (PHQ-9) was used as a proxy measure for recent suicidal ideation. Participants respond to the frequency of these thoughts using a four-point Likert scale ranging from "not at all" to "nearly every day" (*Cronbach's alpha (α)*: Time 1 = 0.84, Time 2 = 0.89). This item of the PHQ-9 has previously been used as an indicator of suicidal thoughts [7] and shown to reliably predict an increased risk of suicide attempt or death [8,9].

Depression, Anxiety, Stress. The Depression, Anxiety, and Stress Scale (DASS-21) is a 21-item questionnaire with seven items assessing each of the three mental health aspects: depression (*Cronbach's alpha (α)*: Time 1 = 0.89, Time 2 = 0.90), anxiety (α: Time 1 = 0.86, Time 2 = 0.85), and stress (α: Time 1 = 0.84, Time 2 = 0.84). Participant responses were recorded using a four-point scale from 0 (never) to 3 (almost always).

Stigma. The five-item Stigma Scale for Receiving Professional Psychological Help (SSRPH) was used to measure public stigma associated with seeking support (e.g., "seeing a psychologist for emotional or interpersonal problems carries social stigma"). Participants rated their level of agreement/disagreement with each statement using a four-point Likert scale ranging from "strongly disagree" to "strongly agree" (*α:* Time 1 = 0.74, Time 2 = 0.86). Higher levels indicated a greater level of perceived stigma associated with seeking professional psychological help.

Help-Seeking Barriers. Barriers to help-seeking were asked with respect to accessing the University's subsidised primary care health service and non-university mental health services. Specifically, using a five-point Likert scale ranging from "definitely would go" to "definitely would not go", participants were first asked to respond to two questions adapted from Bruffaerts et al. [10]: "*As you might know, [the university's health service] offers counselling and psychological services to help students who have emotional problems. If during this year you developed a problem that caused you a lot of distress and interfered with your work, how likely would you be to go to [the university's health service]?*" and "*How likely would you be to go somewhere else for help, like to your doctor, a mental health professional or religious advisor?*". A third question, "*If you decided NOT to seek help if you developed such a problem, how important do you think each of these would be as reasons for NOT seeking help?*" was then asked to all students that did not indicate that they definitely would seek help. Students were asked to indicate how much they agreed with ten possible reasons (e.g., "you would want to handle the problem on your own") using a five-point Likert scale ranging from "unimportant" to "very important", with higher scores indicating stronger levels of agreeance.

3.1.4. Analyses

All analyses were conducted using R (version 4.2.1 [11]). First, descriptive statistics and frequencies were calculated (package: psych [12]), and Spearman's rho correlations were used to determine the relationship between clinical characteristics (e.g., suicidal ideation, depressive symptoms) and the perceived help-seeking barriers, and between clinical characteristics themselves. Wilcoxon rank sum tests (package: ggplot2 [13], Base R [11]) were then used to determine whether help-seeking intentionality differed by gender or study level and, after filtering out responses of "Definitely would go" (as these would be unexpected to lead to the endorsement of perceived barriers), whether the perceived barriers to help-seeking differed between gender or year level.

Wilcoxon signed-rank tests were then used to determine whether a student's intentions to seek help when they were in distress, or their perceived barriers to seeking help, had naturally shifted over time. Finally, linear mixed models were used to determine whether students' likelihood to seek help could be predicted by the perceived barriers or any barrier X time interactions. Since only one person identified as non-binary, comparisons between gender were limited to comparisons between female and male participants.

3.2. Results

3.2.1. Clinical Characteristics

Using the clinical cut-off scores for the DASS-21 [14], 59.9% of the sample scored within the normal range for anxiety, 15.2% in the mild range, 9.8% in the moderate range, 7.7% in the severe range, and 10.4% in the extremely severe range at Time 1. For stress, 69.8% of the sample scored within the normal range, 12.7% in the mild range, 11.1% in the moderate range, 4.8% in the severe range, and 1.6% in the extremely severe range. Additionally, 58.7% of the sample scored within the normal range for depression, 14.5% within the mild range, 14.3% within the moderate range, 6.8% within the severe, and 5.7% within the extremely severe range. No clinically significant changes were observed between Time 1 and Time 2 for depression, anxiety, or stress. A further 16.5% of the sample (n = 73) reported having suicidal ideation for at least several days in the past two weeks.

The relatedness between these characteristics and the perceived barriers to help-seeking can be found in Table 1. Briefly, at Time 1, the frequency of suicidal ideation was associated with greater endorsement of concerns about time, scheduling, or transportation, and fears about the impact on their professional careers, yet reduced endorsement of being willing to talk to friends or family. Symptoms of depression, anxiety, and stress were associated with concerns about the effectiveness of potential treatments, embarrassment, a preference to talk to friends or family, problems with time, scheduling, and transport, fears about the impact on their careers, and worry that people would treat them differently. The same relationships were found with stigma, with the exception of concerns related to time, scheduling and transport, which was not related to stigma.

Table 1. Spearman's rho correlations between Suicidal Ideation, Stigma, Depression, Anxiety, and Stress, *and* barriers to help-seeking for Study One.

	R1	R2	R3	R4	R5	R6	R7	R8	R9	R10
Time 1										
Suicidal Ideation	−0.05	0.14 *	−0.05	0.05	−0.24 ***	0.06	−0.03	0.10 *	0.15 **	0.09
Depression	0.09	0.10 *	0.06	0.08	−0.30 ***	0.11 *	0.03	0.15 **	0.12 *	0.10 *
Anxiety	0.14 **	0.12 *	0.11 *	0.10 *	−0.26 ***	0.09	0.03	0.17 ***	0.20 ***	0.15 **
Stress	0.14 **	0.13 **	0.03	0.10 *	−0.22 ***	0.13 **	0.11 *	0.18 ***	0.20 ***	0.12 **
Stigma	0.06	0.11 *	0.09	0.24 ***	−0.15 **	0.05	−0.08	0.02	0.16 ***	0.31 ***
Time 2										
Suicidal Ideation	0.15 *	0.18 **	0.02	0.12	−0.21 **	0.11	0.05	0.11	0.25 ***	0.12
Depression	0.19 **	0.18 *	0.12	0.11	−0.32 ***	0.06	0.032	0.13	0.12 **	0.15 *
Anxiety	0.04	0.14	−0.03	−0.06	−0.22 **	0.16 *	−0.01	0.09	0.06	−0.01
Stress	0.20	0.17 *	0.07	−0.02	−0.21 **	0.07	0.05	0.16 *	0.20 **	0.09
Stigma	0.16*	0.27 ***	0.12	0.23 **	−0.13	0.09	0.09	0.08	0.24 ***	0.35 ***

Note. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. R1: You do not believe that your distress is/was not serious enough to warrant professional help; R2: You are not sure the available treatments are very effective; R3: You would want to handle the problem on your own; R4: You would be too embarrassed; R5: You would talk to friends or relatives instead; R6: You think it costs too much money; R7: You are unsure of where to go or who to see; R8: You anticipate problems with time, transportation, or scheduling; R9: You are afraid it might harm you school or professional career; R10: You would worry that people would treat you differently if they knew you were in treatment.

These relationships largely remained consistent at Time 2 for suicidal ideation, depression, and stigma. One exception was the belief that their distress was not serious enough for professional support; this belief was positively associated with these characteristics. At Time 2, anxiety and stress were no longer related to perceived embarrassment or worries that they would be treated differently. Anxiety was further unrelated to concerns about treatment effectiveness, time, scheduling, or transport, or fears of the impact on career.

3.2.2. Cross-Sectional Analyses

Help-Seeking Behaviours. Only 15.0% of students reported that they would "definitely go" to the university's health service if they developed a problem that caused emotional distress or interfered with their work, with a further 33.16% saying they "probably would go" (see Table 2). Responses did not differ by gender, $W = 8250$, $p = 0.12$ or year level, $W = 17{,}248$, $p = 0.95$. Additionally, only 14.71% of students reported that they "definitely would go" to another professional for help, with 31.28% saying they "probably would go." Female participants were more likely to seek help from another support service, compared to male participants, $W = 7246$, $p < 0.01$. No differences were observed across year groups, $W = 17{,}081$, $p = 0.92$.

Table 2. Frequencies of student's intentions to engage with support services if they experienced distress.

Option	The University's Health Service (%)	Other Professionals (%)
Definitely would not go	16 (4.28)	12 (3.21)
Probably would not go	55 (14.71)	73 (19.52)
Might or might not go	122 (32.62)	116 (31.02)
Probably would go	124 (33.16)	117 (31.28)
Definitely would go	56 (14.97)	55 (14.71)

Stigma. Overall, participants tended to disagree that seeking professional psychological support is associated with stigma (M = 9.470, SD = 2.72). However, male participants indicated greater perceived stigma than female participants, $W = 11{,}614$, $p < 0.001$. No differences in perceived stigma were observed between year groups, $W = 18{,}603$, $p = 0.17$.

Reasons for not seeking help. For participants who did not respond with "definitely would go" to the university's health service or other professionals, the belief that their distress would not be serious enough to warrant professional help was rated as the most important barrier, followed by the desire to handle the issue independently, and the belief it would cost too much money (Table 3). In contrast, anticipation of problems with time, transportation, and/or scheduling were rated to be the least important barriers. A small number of students also reported concerns that it would harm their career prospects. No significant differences were observed between genders or year level or either support avenue.

Table 3. Perceived barriers to seeking help at Time 1 by gender and year.

Reason	Mean (SD)				
	Overall	Men	Women	Year One	Year Two
You do not believe that your distress is/was not serious enough to warrant professional help.	3.27 (1.15)	3.22 (1.09)	3.29 (1.16)	3.27 (1.14)	3.28 (1.17)
You would want to handle the problem on your own.	3.23 (1.20)	3.24 (1.40)	3.23 (1.16)	3.16 (1.17)	3.33 (1.24)
You think it costs too much money.	3.07 (1.38)	2.74 (1.39)	3.13 (1.37)	3.10 (1.39)	3.02 (1.36)
You would talk to friends or relatives instead.	3.02 (1.27)	3.04 (1.41)	3.02 (1.24)	2.99 (1.28)	3.07 (1.26)
You are unsure of where to go or who to see.	2.74 (1.27)	2.63 (1.17)	2.76 (1.29)	2.79 (1.29)	2.67 (1.24)
You would be too embarrassed.	2.56 (1.29)	2.69 (1.33)	2.54 (1.29)	2.55 (1.35)	2.59 (1.22)
You are not sure the available treatments are very effective.	2.55 (1.12)	2.74 (1.14)	2.51 (1.11)	2.58 (1.12)	2.51 (1.12)
You would worry that people would treat you differently if they knew you were in treatment.	2.50 (1.27)	2.76 (1.34)	2.45 (1.25)	2.49 (1.33)	2.52 (1.20)
You are afraid it might harm you school or professional career.	2.22 (1.32)	2.26 (1.46)	2.22 (1.29)	2.13 (1.27)	2.35 (1.37)
You anticipate problems with time, transportation, or scheduling.	2.20 (1.18)	2.06 (1.28)	2.23 (1.16)	2.25 (1.20)	2.13 (1.16)

3.2.3. Longitudinal Analyses

At Time 2, 17.13% of students said they would "definitely go" to the university's health service if they developed a problem that caused emotional distress or interfered with their work, with a further 27.62% saying they "probably would go." The distribution of responses did not differ over time $V = 2936.5$, $p = 0.74$. Additionally, 18.23% said they "definitely would go" somewhere else for help (e.g., GP), with a further 25.41% saying they "probably would go." Again, the distribution of responses did not differ over time $V = 3124$, $p = 0.90$.

Perceived stigma did not change significantly over time, $V = 4989$, $p = 0.68$. There was little evidence for change over time for barriers to seeking help. The single exception was a significant change regarding time, scheduling and/or transport being a barrier to treatment, with reporting increasing from Time 1 (M = 2.24, SD = 1.20) to Time 2 (M = 2.41, SD = 1.23, $V = 2999.5$, $p = 0.047$).

3.3. Discussion

The current study aimed to understand the barriers students perceive to limit their ability to seek help when they experience mental distress and/or suicidal ideation. Relatively few students in the current study indicated that they would seek support for mental health distress, which is consistent with previous research [2]. In addition, students in this study endorsed similar perceptions of help-seeking barriers to previous research [2,15]. Specifically, the *desire to handle the issue independently* emerged as a strongly perceived barrier, following the perception that *students believed their issues as not serious enough to warrant help*. This is concerning, especially given the high number of participants whose scores indicated they were experiencing clinically significant depression, anxiety, and/or stress symptoms and/or recent thoughts about suicide.

One explanation for the consistent reporting of these barriers is that experiences of mental distress may be normalised in the student population, such that mental distress is viewed as part of being a student studying at university [16,17]. Alternatively, it may be that they continuously alter their definition of mental distress to accommodate their current state [18]. These findings indicate a need to increase mental health literacy and facilitate greater engagement with support services to enable earlier detection of, and intervention for, mental distress [19].

The only change observed over time was an increase in anticipating *greater problems with time, scheduling, and/or transport*. Unlike individual-level factors (e.g., how students perceive their problems), these practical challenges to seeking treatment are difficult to address and likely reflect increasing study demands and work commitments. This also highlights the possibility that students do not feel that they can make or find time to look after their mental health which may, in turn, elevate the risk of mental distress and/or suicidal ideation. It is important to note, however, that the wording of the statement lacks the necessary nuance to discriminate whether it is specifically time, scheduling, transport, or some combination thereof, that is the main issue.

Following on from these findings about individual-level factors, the aim of Study 2 was to assess the impact of a brief mental-health promotion video and infographic. The video and infographic specifically highlighted the main support services available to students, with the intention of increasing their intention to engage with health services and support.

4. Study 2

4.1. Method

4.1.1. Participants

Participants were 133 undergraduate psychology students enrolled at a New Zealand University. Participants were between the ages of 18–35 years old (M = 20.17, SD = 2.31) and the majority identified as female (89.63%, $n = 121$, 11 males, one non-binary). Most participants identified as New Zealand European (78.52%, $n = 106$); the remaining participants identified as Māori ($n = 6$), Asian ($n = 14$), Pasifika ($n = 2$). Eight (6.02%) stated specific

ethnicities which generally fell into other European regions. It is also important to note that participants could select multiple ethnicities.

4.1.2. Procedure

This study was approved by the host university's Ethics Committee (H21/022). Similar to Study 1, undergraduate psychology students were invited to participate for course credit. Students who volunteered to participate were randomly allocated to one of three groups: control, video, or infographic. Participants in the control group were given information about standard helplines only. Participants in the video group were shown a three-minute clip that included nine, thirty-second snippets detailing the locations and services of various university-based support services (e.g., the university's health service), national helplines (e.g., 1737), and well-being-based help services (e.g., Headspace App). Participants in the infographic group were presented with written information corresponding to the same nine services described in the video. The names of the services were first presented in a 3 × 3 grid alongside a related image (see Figure 1). They were then further elaborated upon across three panels, with each panel describing three services.

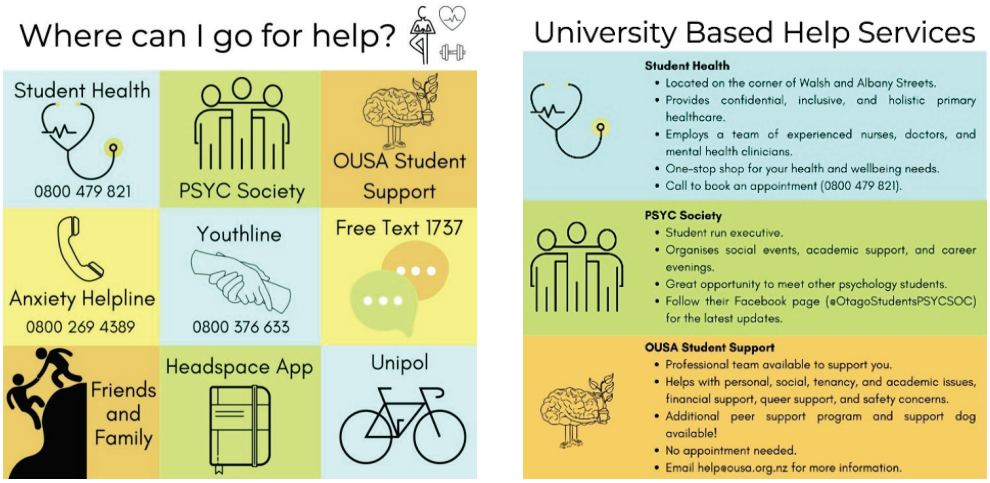

Figure 1. Examples of the infographic intervention. On the left, the initial 3 × 3 grid depicts all services and on the right the more detailed panel provides more information about the services.

All participants were asked to complete three electronic surveys using Qualtrics across a six-week period (Baseline, Week One; Post-Intervention, Week Three, Follow-Up, Week Seven). Each survey link, along with reminders, was emailed to participants. For participants in the intervention groups (infographic and video), the material was embedded into the Qualtrics survey (at the end of survey one and the start of survey two). All participants were given the infographic and video at the conclusion of the study.

4.1.3. Measures

The same measures as Study 1 were used, with the exception of the PHQ-9 item related to suicidal ideation. Internal consistency was high across all scales: Depression (*Cronbach's alpha* (α) = 0.893), Anxiety (*Cronbach's alpha* (α) = 0.822), Stress (*Cronbach's alpha* (α) = 0.796).

4.1.4. Data Analysis

All analyses were conducted using R (version 4.2.1. [11]). First, descriptive statistics and frequencies were calculated (package: psych [12]). Kruskal–Wallis rank sum tests were used to understand whether group endorsements of perceived barriers changed over time or whether groups differed in the perceived barriers post-intervention (Time 2). Finally, linear mixed models were then used to determine whether any Group X Time interaction effects were present for each perceived help-seeking barrier (package: lmerTest [20]).

4.2. Results

4.2.1. Clinical Characteristics

Using the clinical cut-off scores for the DASS-21 [14] at Time 1, 48.9% of the sample scored within the normal range for depression, 16.5% in the mild range, 21.8% in the moderate range, 8.3% in the severe range, and 4.5% in the extremely severe range. For anxiety, 37.6% of the sample scored within the normal range, 23.3% in the mild range, 17.3% in the moderate range, 7.5% in the severe range, and 14.3% in the extremely severe range. Additionally, 49.6% of the sample scored within the normal range for stress, 24.1% in the mild range, 18.0% in the moderate range, 6.8% in the severe range, and 1.5% in the extremely severe range. These are comparable to the sample used with Study 1.

4.2.2. Help-Seeking Intentionality

No significant within-group changes in intentions for seeking help from the university's health service or other professions were observed over time for any group (see Table 4). Likewise, no between-groups differences were observed post-intervention for intentions to seek support from the university's health service. On the other hand, a significant difference between the control and intervention groups was observed post-intervention for students who would seek support from other services ($p = 0.035$). Participants in the infographic group were significantly more likely to seek support compared to the control group, $M_{Infographic} = 3.52$, SD = 1.02 vs. $M_{Control} = 3.05$, SD = 1.03; no differences were observed between the control and video groups or infographic and video groups, however.

Table 4. Mean and standard deviation of intention to seek help and the perceived barriers to seeking help by intervention group and time.

Group	Time	*n*	Mean (SD)										
			The University's Health Service	Other Professional	R1	R2	R3	R4	R5	R6	R7	R8	R9	R10
C	T1	44	3.16 (1.26)	3.34 (1.03)	3.07 (1.02)	2.50 (1.15)	3.43 (1.00)	2.70 (1.29)	3.05 (1.18)	3.14 (1.27)	3.07 (1.19)	2.57 (1.28)	2.20 (1.15)	2.57 (1.19)
C	T2	44	3.09 (1.16)	3.05 (1.03)	3.27 (0.79)	2.59 (1.04)	3.36 (0.92)	2.59 (1.13)	2.98 (1.11)	3.07 (1.28)	2.68 (1.22)	2.45 (1.07)	2.25 (1.28)	2.32 (1.07)
C	T3	44	3.25 (1.14)	3.18 (1.04)	3.02 (1.02)	2.57 (1.19)	3.20 (1.02)	2.32 (1.09)	2.95 (1.08)	2.93 (1.19)	2.75 (1.18)	2.52 (1.23)	2.30 (1.30)	2.43 (1.07)
I	T1	42	3.67 (1.05)	3.52 (1.02)	3.40 (1.25)	2.62 (1.15)	2.98 (1.07)	2.21 (1.20)	3.14 (1.12)	3.50 (1.42)	2.93 (1.26)	2.52 (1.25)	2.24 (1.30)	2.26 (1.29)
I	T2	42	3.40 (1.11)	3.52 (1.02)	2.98 (1.12)	2.57 (1.15)	3.02 (1.16)	2.19 (0.89)	3.12 (1.13)	3.60 (1.25)	2.62 (1.17)	2.60 (1.23)	2.26 (1.13)	2.12 (1.15)
I	T3	42	3.31 (1.05)	3.36 (1.1)	3.26 (1.13)	2.57 (1.06)	3.17 (1.10)	2.26 (1.13)	3.02 (1.05)	3.29 (1.17)	2.52 (1.11)	2.57 (1.13)	2.40 (1.29)	2.26 (0.94)
V	T1	47	3.36 (1.19)	3.32 (1.14)	3.21 (1.16)	2.47 (1.00)	3.21 (1.20)	2.34 (1.11)	3.17 (1.24)	3.32 (1.30)	3.00 (1.23)	2.38 (1.23)	1.94 (1.13)	2.00 (1.22)
V	T2	47	3.09 (1.16)	3.26 (1.19)	3.30 (1.00)	2.36 (0.94)	3.32 (1.14)	2.26 (1.28)	3.00 (1.16)	2.94 (1.26)	2.62 (1.07)	2.45 (1.16)	2.00 (1.04)	1.91 (1.04)
V	T3	47	3.26 (1.07)	3.23 (1.13)	3.45 (1.00)	2.60 (1.06)	3.28 (1.04)	2.23 (1.24)	3.28 (0.93)	3.15 (1.18)	2.72 (1.21)	2.60 (1.19)	2.09 (1.21)	2.09 (1.16)

R1: You do not believe that your distress is/was not serious enough to warrant professional help; R2: You are not sure the available treatments are very effective; R3: You would want to handle the problem on your own; R4: You would be too embarrassed; R5: You would talk to friends or relatives instead; R6: You think it costs too much money; R7: You are unsure of where to go or who to see; R8: You anticipate problems with time, transportation, or scheduling; R9: You are afraid it might harm you school or professional career; R10: You would worry that people would treat you differently if they knew you were in treatment.

4.2.3. Reasons for Not Seeking Help

Across all ten help-seeking barriers, no significant within-group changes were observed over time for any group. Likewise, across the barriers, neither the infographic nor video groups significantly differed from the control group. A post-intervention difference was observed between the video and infographic groups regarding the perceived financial barrier to seeking help, with those in the infographic group being significantly more

likely to believe that financial costs would limit their access to support, $M_{Infographic}$ = 3.60, SD = 1.25 vs. M_{Video} = 2.94, SD = 1.26, p = 0.017.

Specifically looking at post-intervention (Time 2), one significant Group X Time interaction emerged. Participants in the infographic group were significantly more inclined to disagree that their distress was not serious enough to warrant support, B = −0.63, p = 0.009. This effect was not maintained over time, however. No other post-intervention interaction effects were observed (full results can be found within the Supplementary Materials).

4.3. Discussion

The current study found evidence that an infographic about available mental health services had a positive effect on intentions to seek help from mental health professionals outside the university's health services but no evidence was found to support the effect of a short education-based video. These findings partially support previous promising evidence that interventions may be able to generate positive shifts in attitude towards seeking help when experiencing mental distress [5,6].

In considering why the infographic was more effective, one possibility is that the infographic allowed easier absorption of information by viewers than the video. It could subsequently be viewed more passively than a more time-demanding video [21]. While these results align with asthma-related research showing an infographic intervention is more effective than a video [21], they do differ from breast cancer screening research which found that videos are more effective [22]. As such, the effectiveness of an infographic compared to a video in communicating health-related information may depend on the target audience, the specific health issue addressed, and the design of the media. Future research should continue to explore what aspects of media best connect with university students to improve their intentions towards seeking support.

Perhaps more importantly, the Group X Time interaction for students' belief that their issues are not serious enough to warrant help suggests that the infographic may have increased mental health literacy about when to seek help and potentially reduced comparisons between individuals (i.e., countering the effects observed in past literature [16,17]). This is critical from a prevention lens that focuses on intervening before the individual's distress escalates.

A limitation of the infographic intervention was that it only described the services and may not have sufficiently engaged students to enact a behavioural change [5]. While it may increase awareness about different services and when to seek help, more specific and concerted efforts may be required to increase engagement with support services. Furthermore, this study did not include a specific measure related to suicide. Although the DASS-21 Depression subscale has been found to predict suicide (e.g., Ibrahim et al. [23]), replication of this study with explicit measures for suicide is required.

5. General Conclusions

This series of studies has contributed to the emerging literature on university student's attitudes and behaviours towards help-seeking by (1) replicating earlier cross-sectional work by the WHO World Mental Health Surveys International College Student Project [1,2], (2) longitudinally testing whether students' perceptions and intentions to seek help if experiencing mental distress shift over time, and (3) examining whether a small-scale intervention can shift student's attitudes and behaviours towards help-seeking if distress were to be experienced.

Consistent with prior research, the findings of the current studies have highlighted that, among Aotearoa New Zealand university students, there is a perception that their issues are not serious enough to warrant support and a desire to handle the issues independently. Concerningly, these perceptions were also paired with clinically relevant symptoms of depression and anxiety, and suicidal ideation. Furthermore, we also found increased perceptions of barriers to help-seeking related to time, scheduling, or transport preventing the ability for one to seek support. The combination of these findings presents a key

paradox that, although informational interventions may be able to shift students' attitudes and intentions towards seeking help, until methods are found to increase the capacity for them to engage with support services, efforts in this area may not result in the desired reductions in negative outcomes when mental distress is experienced (e.g., prevention of suicide, positive academic outcomes).

The overall tendency to disagree that seeking professional psychological help is associated with negative public stigma aligns with previous research that broader perceptions about what others may think do not appear to prevent students from seeking help [15,16,24]. It is important to note, however, that while overall perceptions of public stigma were low, males were still more likely to perceive greater levels of public stigma than females; a finding that is, perhaps, unsurprising given the hegemonic masculinity ideals (e.g., kiwi stoicism [25]) that remain entrenched within the Aotearoa New Zealand context. Although the overall reduction reflects a shift in this area, a continued focus on reducing stigma related to mens' help-seeking is required.

This study is not without limitations. Beyond those already discussed, it is also essential to consider the barriers examined are not an exhaustive list of reasons that may reduce a student's willingness to seek help. Although they were replicated from prior research [1], future research should extend this research to consider broader help-seeking barriers, for example, the fear of losing autonomy or involuntary hospitalisation [26].

Positively, the present study presents evidence that a simple infographic intervention can shift a student's perspective that their distress is not serious enough to seek support. This could have real-world applications as it suggests that universities may be able to positively engage students through social media-style content and, as such, is a low-cost mechanism for intervention. Further efforts would be required to ensure that the effects of such interventions persist over time and translate into greater engagement with support services, provided support services are accessible. If effective, they could easily be adapted for specific purposes (e.g., suicide prevention, exam-related stress).

6. Conclusions

In conclusion, this series of studies contributes to our understanding of the barriers that may prevent university students from seeking help and ways that may help to shift their perceptions of these barriers. By addressing these perceived barriers, it may be possible to facilitate students towards earlier engagement with support services and subsequently reduce the risk of progression to severe mental distress and/or suicide. Future research should expand the proposed intervention method to examine its utility and effectiveness in different countries and populations, and whether it can be targeted for specific samples.

Supplementary Materials: The following supporting information can be downloaded at: https://www.mdpi.com/article/10.3390/ijerph192315836/s1, Table S1: Spearman's rho Intercorrelations between Suicidal Ideation, Stigma, and symptoms of Depression, Anxiety, and Stress at Time One, Study One; Table S2: Linear Mixed Models examining Group X Time interactions for each help-seeking barrier.

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Informed Consent Statement: Informed consent was obtained from all subjects involved in the study.

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