

Article

Risk of Self-Harm in Patients with Trichotillomania: A Population-Based Cohort Study

Selina Kit Yi Chan ¹, Kelvin K. F. Tsoi ^{2,3}, Terry Cheuk Fung Yip ⁴ , Vivien Wei Jun Liew ¹ and Wai Kwong Tang ^{1,*}¹ Department of Psychiatry, The Chinese University of Hong Kong, Shatin, New Territories, Hong Kong SAR, China² Jockey Club School of Public Health and Primary Care, The Chinese University of Hong Kong, Shatin, New Territories, Hong Kong SAR, China³ Stanley Ho Big Data Decision Analytics Research Centre, The Chinese University of Hong Kong, Shatin, New Territories, Hong Kong SAR, China⁴ Department of Medicine and Therapeutics, The Chinese University of Hong Kong, Shatin, New Territories, Hong Kong SAR, China

* Correspondence: tangwk@cuhk.edu.hk

Abstract

Background: This study aimed to investigate whether individuals with trichotillomania (TTM) are at a higher risk of engaging in self-harm behaviors compared to those without TTM. **Methods:** In this matched cohort study, we analyzed electronic health records of all patients admitted to public hospitals in Hong Kong from 1 January 1993 to 31 December 2022. We identified a TTM cohort of 285 patients and a comparison cohort of 285 individuals. All participants were followed up until they received a diagnosis of self-harm, died from other causes, or until the end of 2023, whichever came first. To assess the risk of self-harm following TTM onset, Cox proportional hazards regression models were applied. **Results:** Throughout the 30-year study period, the number of individuals who exhibited self-harm behavior in the TTM and comparison groups was 8 (2.8%) and 8 (2.8%), respectively. The TTM and comparison groups had similar proportions of subjects who inflicted self-harm ($\chi^2 = 0.00$, $p = 0.977$). The incidence of self-harm was 26.00 and 26.92 per 10,000 person-years in the TTM and comparison groups, respectively. Compared with the comparison group, the adjusted hazard ratio for self-harm in the TTM group was 1.44 (95% confidence interval, 0.45–4.61). **Conclusions:** TTM is not associated with an increased risk of self-harm. Future research is necessary to replicate our findings and more fully elucidate the potential unique risk factors for self-harm in these patients.

Keywords: trichotillomania; self-harm; risk; depression; suicidal; cohort study



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1. Introduction

Trichotillomania (TTM) is characterized by a failure to resist impulses to pull out one's hair, often resulting in noticeable hair loss [1]. The most common pulling sites reported are the scalp, eyelashes, eyebrows, beard, and pubic hair [2]. TTM is classified under obsessive-compulsive disorder (OCD) and related disorders in the Diagnostic and Statistical Manual Version 5 [1]. The prevalence of TTM ranges from 1% to 3% with a marked predominance among women [3]. Underdiagnosis due to profound shame and concealment behaviors is rampant; previous research has reported TTM rates up to 4.4%, yet less than 4% of patients reportedly received psychiatric care [4,5].

From the Greek roots *trich* (hair), *tillein* (to pull), and *mania* (madness), TTM was first formally named “trichotillomanie” in 1889 by French dermatologist François Henri

Hallopeau, who described it as a distinct form of self-inflicted alopecia characterized by compulsive hair pulling [6,7]. Historically interpreted through psychoanalytic lenses as displacement of unconscious impulses [8,9], TTM gained more recent recognition with DSM-III inclusion in 1980 as an impulse-control disorder, before its 2013 DSM-5 reclassification under obsessive-compulsive and related disorders reflecting shared symptom expression, comorbidity, and familial patterns with obsessive-compulsive disorder (OCD) [1,10,11].

TTM typically follows a chronic and fluctuating course. Its onset occurs most often in late childhood or early adolescence (typically around ages 9–13) [12], with a tendency to persist for years or even decades without treatment [13]. Symptoms commonly wax and wane, with periods of partial remission interspersed with relapses, and exacerbations frequently occurring during times of heightened stress or negative affect [14]. Across clinical samples of TTM, later age of onset, higher baseline severity, and comorbid depressive, anxiety, or obsessive-compulsive spectrum disorders are consistently associated with a more severe and persistent course [14–16], as well as greater functional impairment [16]. Female sex is overrepresented among affected individuals (typically 8:1 to 10:1 female-to-male ratio), with cross-cultural studies showing similar predominance (14:1 in Europe; 10:1 in North America), potentially reflecting help-seeking differences rather than true incidence variation [17,18]. Females consistently report greater subjective distress and treatment engagement, although sex differences in illness refractoriness remain less well established [3]. While a minority of individuals report spontaneous remission, most experience at least moderate chronic symptoms and substantial concealment of hair loss, often delaying help-seeking for years, which further entrenches pulling habits and shame [5,13]. Prognosis improves with evidence-based cognitive-behavioral interventions such as habit-reversal training (HRT) and acceptance-enhanced behavioral therapy [19,20], but residual symptoms and risk of recurrence remain common, supporting the view of TTM as a long-term, relapsing condition that warrants ongoing monitoring and booster sessions rather than a self-limiting disorder [14,21].

TTM is frequently associated with poor self-esteem, depression, psychosocial dysfunction, and overall poor quality of life [22]. Individuals with TTM often report feelings of unattractiveness, humiliation, and low self-confidence [23]. Around 45% of people with TTM have a comorbid major depressive disorder [24]. Given the negative consequences associated with TTM and the elevated rates of a co-occurring major depressive disorder, it is expected that the rate of self-harm and suicidal attempts may also be elevated in this population.

TTM shares considerable conceptual overlap with both non-suicidal self-injury (NSSI) and intentional self-harm or suicidality, primarily via emotion dysregulation [25]. TTM's two distinct phenotypes, i.e., automatic and focused hair-pulling [26], represent distinct behavioral expressions of these mechanisms that recapitulate core self-harm phenomenology and amplify vulnerability to broader self-damaging behaviors [27].

TTM's bimodal clinical presentation provides critical insight into these shared pathways. Automatic hair-pulling, the dominant style in roughly half of individuals with TTM, is triggered by visual or tactile cues on the body [26,28,29]. This phenotype closely resembles compulsive behaviors seen in tic disorders, driven primarily by striatal habit automatization with minimal preceding cognitive or emotional awareness [30]. In contrast, focused hair-pulling, a phenotype that demonstrates stronger impulsive features, follows a conscious, tension-driven sequence [26]. A mounting somatic or emotional urge, often accompanied by anxiety, boredom, shame, or perfectionistic "just right" sensations, leads to deliberate hair-pulling followed by transient relief or gratification [29,31–33]. Most TTM patients exhibit a mixture of both phenotypes, explaining the disorder's clinical heterogeneity.

ity, where automatic-dominant cases appear more “compulsive” and focused-dominant cases more “impulsive” [26,32].

Emotional dysregulation, defined as persistent deficits in recognizing, tolerating, and modulating negative affect [34], represents a core mechanism linking both TTM phenotypes to self-harm and suicidality. In automatic pulling, the repetitive sensory-motor behavior may function as a subtle distraction from chronic background dysphoria or understimulation [33,35]. Although it appears less emotionally charged, its cumulative consequences, particularly visible disfigurement, can generate shame, social withdrawal, and low-grade distress that further perpetuate emotional dysregulation over time [36,37]. In contrast, focused pulling more explicitly targets acute tension buildup, with hair-pulling delivering immediate emotional relief through sensory substitution or achievement of perceptual perfection [33,36–38]. This cycle closely parallels the affect-regulation pattern observed in NSSI and deliberate self-harm, where behaviors such as cutting or burning rapidly reduce tension or overwhelming emotional pain [27,39,40], and may conceptually extend to suicidal behavior when distress becomes chronically intolerable [41,42]. Consistent with this framework, individuals with predominantly focused pulling consistently show higher rates of depression, anxiety, and stress than those with automatic pulling [26,43], as this pattern more directly engages acute emotional regulation failures [26,43]. The experiential avoidance model [44] further frames both TTM phenotypes, as well as self-harm, as negatively reinforced coping strategies: short-term affect reduction strengthens the behavior despite its long-term consequences of worsening shame, isolation, and functional impairment [26,27,45,46].

Published data on suicidal attempts or ideation in individuals with TTM are limited. A cross-sectional Web-based study found a probable diagnosis of TTM was related to suicidal ideation (odds ratio = 1.9) [24]. In another cross-sectional study comprising 219 adults with TTM, five (2.3%) reported a lifetime suicide attempt [47]. This study had no control group [47]. Subjects were recruited from a diverse group of research studies; hence, the findings of that study may not be generalizable to people with TTM in the community or specific clinical practice situations. In addition, 80% of the subjects were Caucasians, and therefore, the findings may not be applicable to other ethnicities. The purpose of the present study was to determine whether individuals with TTM have an increased risk of self-harm behaviors relative to those without TTM.

2. Materials and Methods

2.1. Data Source

In this matched cohort study, we leveraged the Hong Kong Clinical Data Analysis and Reporting System (CDARS) to examine the electronic health records of all patients admitted to Hong Kong public hospitals for any reason between 1 January 1993 and 31 December 2022. Data from the CDARS have been utilized in prior epidemiological studies and have demonstrated reliability [48]. The system comprises electronic health records maintained by the Hong Kong Hospital Authority, a statutory organization responsible for overseeing all public hospitals serving Hong Kong’s population of 7.7 million. Hong Kong’s healthcare system currently delivers medical care across three levels: primary, secondary, and tertiary, through both public and private healthcare sectors [49]. Public healthcare services in Hong Kong are provided by the Hospital Authority, which oversees the management of all public hospitals. According to data from 2017, the Hospital Authority accounted for approximately 80% of inpatient visits and 30% of outpatient visits [50]. The CDARS encrypts patient personal information to ensure privacy protection and provides researchers with anonymous identification numbers. The validity and reliability of the CDARS database have been demonstrated. For example, a validation study reported a

positive predictive value of 96.8% for the diagnosis of fractures recorded in the CDARS [51]. The current study was approved by the institutional review board of the Chinese University of Hong Kong (CREC 2020.707).

2.2. TTM Cases

TTM cases were identified as individuals who received outpatient, emergency department, or inpatient care with a first-recorded diagnosis of TTM during the study period. For each case, the follow-up period commenced on the date of the initial TTM diagnosis. The International Classification of Diseases (ICD)-9 code 312.39 was used to identify TTM [1].

2.3. Non-TTM Comparison Group

To compose a comparable cohort without TTM, we randomly selected individuals without a history of TTM and matched them to the TTM patients based on sex and age at admission. A random month and day were assigned along with the same index year as the corresponding patient's index date. For all comparators, the matched admission date was designated as the start of their follow-up period.

2.4. Covariates

For both the TTM and comparison groups, data on ethnicity, residential districts, and diagnoses of depression and bipolar disorders (ICD-9 code 296), ADHD (ICD-9 code 314.00, 314.0, 314.01), substance use disorders (ICD-9 code 291, 292, 303–305), and personality disorders (ICD-9 code 301) were also extracted from the CDARS database.

2.5. Outcome Measurement

Participants in both study cohorts were observed from their respective index dates until the earliest of three endpoints: a self-harm diagnosis, death from any causes, or 31 December 2023. Due to frequent under-reporting of self-harm in hospital records, often influenced by social stigma and the complexity of assessing intent [52], we adopted an inclusive approach to defining self-harm behavior, using an expanded set of ICD-9 codes rather than restricting to intentional self-harm alone. This broader classification encompassed all forms of self-harm, with and without suicidal intent, whether intentional or unintentional. In this study, self-harm was operationalized as the presence of relevant ICD-9 codes in CDARS. The ICD-9 codes utilized to identify self-harm included E950–59 (self-harm) and E980–89 (self-harm of undetermined intent), which were applied uniformly within CDARS throughout the study period. The E950–E959 codes capture injuries explicitly documented as self-inflicted (e.g., poisoning, hanging, cutting, or jumping from height), while the E980–E989 codes capture injuries with similar mechanisms where intent could not be definitively established. Together, these codes represent medically documented self-inflicted injury, including suicide attempts and other hospital-treated self-harm episodes. Follow-up commenced either from the date of TTM diagnosis or the matched admission date for comparators, continuing until any of the specified endpoints were reached.

2.6. Statistical Analysis

The number and proportion of individuals who engaged in self-harm were calculated separately for both the TTM cases and the comparator group. Differences in the proportion of self-harming individuals between the two groups were assessed using the Chi-square (χ^2) test. To evaluate temporal patterns in the incidence of self-harm following the initial diagnosis of TTM, Kaplan–Meier survival curves were generated and compared using the log-rank test. Incidence rates of self-harm were expressed as the number of self-harm events per 10,000 person-years of follow-up. Cox proportional hazards regression models were employed to estimate hazard ratios (HRs) and the 95% confidence intervals (CIs)

of the risk of self-harm since TTM onset, incorporating time at risk and adjusting for covariates including age, sex, ethnicity, residential district, and diagnoses of depression and bipolar disorders. A cumulative incidence plot of self-harm was generated based on the competing risks regression model, and sensitivity analyses were conducted by restricting self-harm events to those coded as ICD-9 E950–E959. All statistical analyses were performed using STATA (Release 19, StataCorp, College Station, TX, USA), with a significance level set at $p < 0.05$.

3. Results

We identified a TTM cohort of 285 patients and a comparison cohort of 285 subjects (Figure 1).

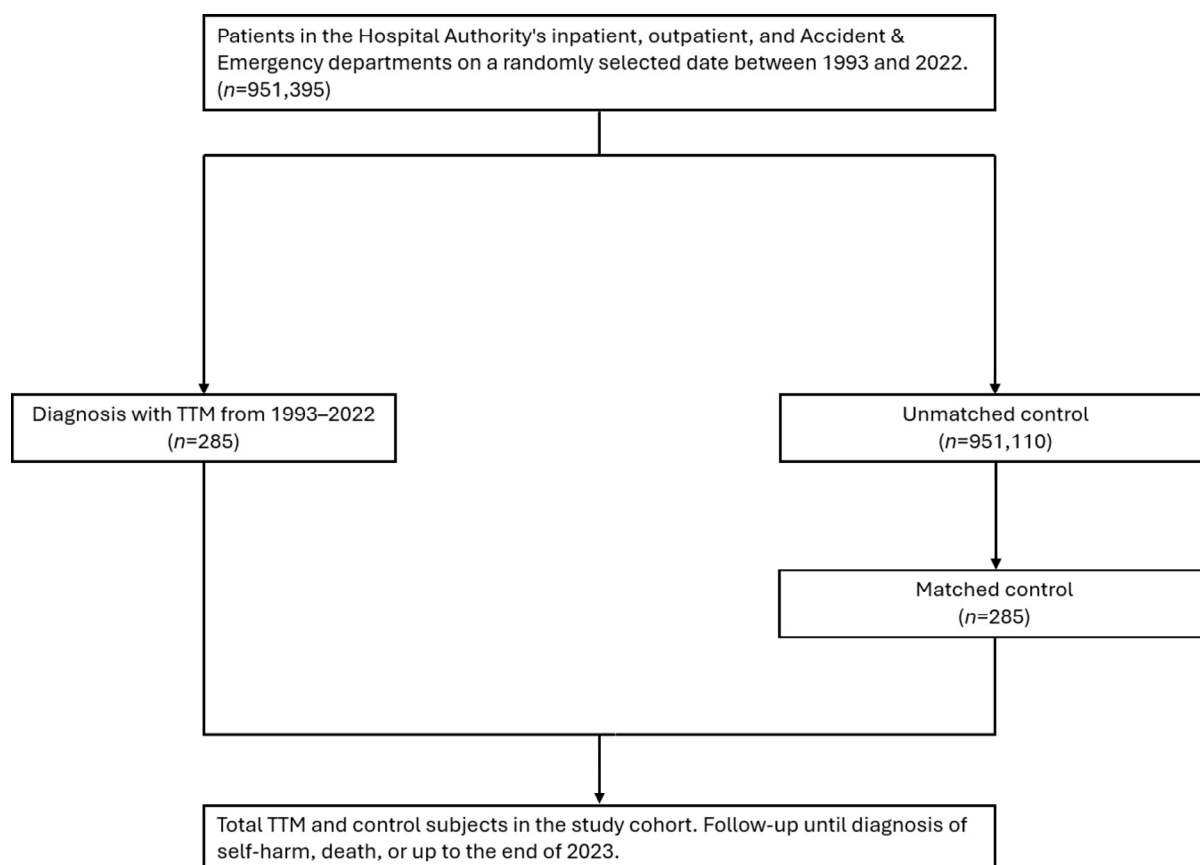


Figure 1. The flowchart of participant selection.

The distributions of sex (63% female), ethnicity, and age (14.2 ± 8.5 years) did not differ significantly between the two groups. Participants in the TTM group were more likely to live in the New Territories or on Hong Kong Island. The prevalence of depression or bipolar disorders, ADHD, substance use disorders, and personality disorders in the TTM and comparison groups was 5.3% versus 3.2%, 8.8 versus 10.2%, 0.4% versus 1.4%, and 0.4% versus 2.5%, respectively (Table 1).

Table 1. Demographic and clinical characteristics in the study cohort.

	TTM ($n = 285$)	Comparison Cohort ($n = 285$)	p -Value ^a
Gender			1.000
Male	106 (37.2)	106 (37.2)	
Female	179 (62.8)	179 (62.8)	

Table 1. Cont.

	TTM (<i>n</i> = 285)	Comparison Cohort (<i>n</i> = 285)	<i>p</i> -Value ^a
Age			1.000
≤10	93 (32.6)	93 (32.6)	
11–20	161 (56.5)	161 (56.5)	
21–40	23 (8.1)	23 (8.1)	
41–60	8 (2.8)	8 (2.8)	
61–80	0 (0)	0 (0)	
≥81	0 (0)	0 (0)	
Age, mean ± SD	14.2 ± 8.5	14.2 ± 8.5	1.000
Ethnicity			0.127
Chinese	250 (87.7)	262 (91.9)	
non-Chinese	35 (12.3)	23 (8.1)	
District			
New Territories	119 (41.8)	92 (32.3)	0.024
Kowloon	85 (29.8)	80 (28.1)	0.356
Hong Kong Island	80 (28.1)	113 (39.6)	0.002
Other Island	1 (0.4)	0 (0)	0.500
History of depression and bipolar	15 (5.3)	9 (3.2)	0.297
History of ADHD	25 (8.8)	29 (10.2)	0.668
History of personality disorders	1 (0.4)	4 (1.4)	0.373
History of substance use disorders	1 (0.4)	7 (2.5)	0.068
Average time to self-harm (years), mean ± SD, median (IQR)	3.3 ± 3.5 2.5 (0–11)	1.7 ± 2.1 0.8 (0–5)	0.505 ^b

^a Fisher's exact test; ^b Mann–Whitney U test; SD = standard deviation; IQR = interquartile range.

Throughout the 30-year study period, the number of individuals who exhibited self-harm behavior in the TTM and comparison groups were 8 (2.8%) and 8 (2.8%); the incidence of self-harm was 26.00 for the TTM group and 26.92 per 10,000 person-years for the comparison group. Kaplan–Meier analysis suggested that the incidence of self-harm was similar between the TTM and comparison groups (log-rank $p = 0.977$; Figure 2).

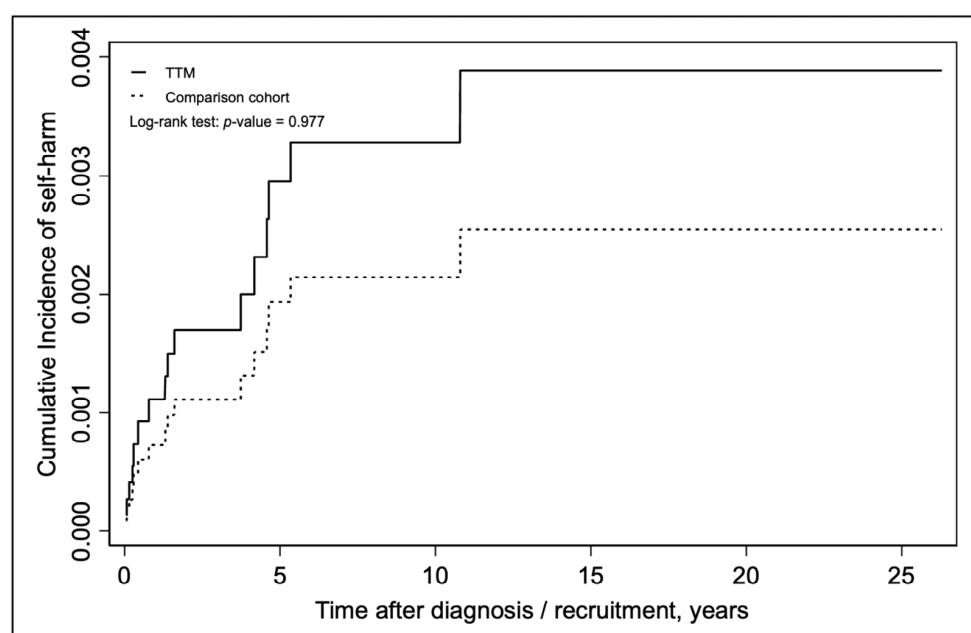


Figure 2. Cumulative incidence of self-harm, adjusted for age, sex, ethnicity, residential district, history of depression, bipolar disorders, ADHD, personality disorders, and substance use disorders.

Compared to the comparison group, the corresponding unadjusted HR for self-harm in the TTM group was 0.99 (95% CI, 0.37–2.67, $p = 0.977$); the HR adjusted for age, sex, ethnicity, residential district, and a diagnosis of depression and bipolar disorders, ADHD, substance use disorders, and personality disorders in the TTM group was 1.44 (95% CI, 0.45–4.61, $p = 0.540$) relative to the comparison group. When self-harm was restricted to intentional self-harm events (ICD-9 codes E950–E959) in the sensitivity analysis, the adjusted HR was 1.24 (95% CI, 0.38–4.08). The mean and median (IQR) duration of self-harm occurrences was 3.3 ± 3.5 and 2.5 (0.1–10.8) years respectively for the TTM group, and 1.7 ± 2.1 and 0.8 (0.1–5.3) years respectively for the comparison group.

4. Discussion

To the best of our knowledge, this study represents the first systematic investigation into the risk of self-harm among patients following their initial diagnosis of TTM. No statistically significant difference in the incidence of self-harm was observed between the TTM patients and the comparator group, even after adjusting for diagnosed mood disorders.

In this study, the risk of self-harm in the TTM patients was similar to that in the comparators. This null finding appears inconsistent with the robust emotional dysregulation mechanisms linking TTM to self-harm outlined in our introduction, but likely reflects ascertainment of milder community TTM cases in contrast to the severe, focused-pulling phenotypes driving theoretical models. As most individuals with TTM exhibit a mixture of automatic and focused pulling [26], hospital-based samples may disproportionately capture milder, automatic-dominant presentations in which self-harm risk operates through a more indirect and attenuated pathway, given that the focused subtype most directly engages the affect-regulation pathway implicated in self-harm. Notably, the near-identical incidence rates (26.00 vs. 26.92 per 10,000 person-years) suggested that TTM confers no incremental self-harm risk beyond the psychiatric baseline of the comparison group. Conversely, research on OCD have consistently shown a higher risk of suicide and suicide attempts in affected individuals. For example, a population-based cohort study in Sweden found that the HR for suicide among individuals with OCD was 4.9 when compared to unaffected full siblings [53]. Another Swedish population-based study reported an odds ratio of 5.5 for suicide attempts in OCD patients relative to matched controls [54]. Additionally, a systematic review of epidemiological data revealed that individuals with OCD have significantly higher odds of a lifetime history of suicide attempts, with odds ratio ranging from 1.6 to 9.9, compared to those without OCD [55]. Several factors may explain the lack of increased self-harm risk observed in the TTM group in the current study, including potential under-reporting of self-harm, a possibly elevated risk in the comparison group, and the younger age and lower prevalence of mood disorders within the TTM participants. A plausible mechanism underlying the elevated comparison-group risk relates to the transdiagnostic nature of emotional dysregulation and experiential avoidance [46]. These pathways, while central to TTM's link with self-harm, are not specific to TTM and are widely observed across psychiatric conditions [46]. Individuals in the comparison group likely carry comparable burdens of mood, anxiety, and impulse-control comorbidities that engage the same affect-regulation failures. Under this framework, TTM does not incrementally elevate self-harm risk above the already-elevated psychiatric baseline, rendering a null between-group difference mechanistically coherent rather than paradoxical. Furthermore, methodological differences must be considered: previous studies focused on completed suicides rather than suicide attempts [53], utilized unaffected siblings as controls [53], and did not adjust HRs for comorbid depression or bipolar disorder [54], unlike our study. In the current study,

2.5% of patients exhibited self-harm; this figure is similar to the rate of suicidal attempt (2.3%) in a cross-sectional study comprising 219 adults with TTM [47]. Individuals with TTM appear to have a lower rate of self-harm than those with OCD [56]. One possible explanation for this difference could be that the symptoms of TTM, while impairing, are less likely to result in suicidal ideation or attempts than the symptoms of OCD or body dysmorphic disorder [47]. From a behavioral substitution perspective, TTM may not confer an elevated risk of self-harm, consistent with our null findings. TTM features a distinct phenotype in which compulsive hair-pulling acts as a stereotyped impulse-control mechanism and tension-relieving strategy, fulfilling self-regulatory needs through negative reinforcement (e.g., tension reduction), much like other self-injurious behaviors [57,58]. This pattern may render hair-pulling a less severe alternative that mitigates escalation to behaviors such as cutting or burning via habit-specific sensory gratification [57]. Empirical evidence has suggested that individuals with TTM exhibit lower rates of suicidality relative to other obsessive-compulsive and related disorders [47,56], potentially reflecting protective factors such as relatively contained ego-dystonic distress [59].

Although NSSI is reported in approximately 50% of body-focused repetitive behavior (BFRB) cases including TTM, such behaviors typically manifest within broader impulse dyscontrol profiles rather than signifying a direct causal pathway to intentional self-harm [39]. This pattern aligns with the absence of significant association observed in the current population-based study.

This study has notable limitations. Our analysis showed a hazard ratio of 1.44 for self-harm risk in the TTM group compared with matched controls. However, this did not reach statistical significance, and the 95% confidence interval was very wide (95% CI: 0.45–4.61). This finding should be interpreted with caution given the study's limited statistical power. Although a sample of 570 participants is substantial for a specialized regional study in Hong Kong, the incidence of self-harm was low, with only 16 events (2.8%), evenly split between the two groups. Because survival analysis power depends primarily on the number of events rather than the total sample size, a post hoc calculation using Schoenfeld's method suggests that the model was underpowered to detect a 44% increase in risk. To achieve 80% power for an effect of this magnitude, approximately 236 events would have been required. With only 16 events, the study was therefore only capable of detecting substantially larger effects (e.g., $HR \geq 3.5$). Therefore, the non-significant result and wide confidence interval more likely reflect insufficient statistical information than evidence of no clinical association.

The sample derived from CDARS medical records excluded data from private hospitals, clinics, and general outpatient clinic services. Consequently, the absence of a link between TTM and self-harm warrants cautious interpretation. Our outcomes reflected only self-harm incidents prompting public hospital visits, omitting events in other contexts or those not seeking medical care. This contrasts with survey studies using lifetime self-reports [60,61], which encompass wider behaviors and intensities. Differences in self-harm ascertainment may underlie the reduced rates in our data and could weaken observed associations. Given the relatively low number of observed self-harm events and the resulting wide confidence intervals, we cannot exclude the possibility of a Type II error. Such variances account for divergences of our findings from prior clinical or community research showing elevated self-harm prevalence.

Additionally, the CDARS database did not provide socioeconomic data or pre-diagnosis histories of smoking or alcohol use. Only records of heavy use documented after the diagnosis of related diseases were available, which may have limited adjustment for important lifestyle confounders. Furthermore, comparators drawn from hospital and

outpatient clinic records likely carried a greater self-harm risk than the general population, which may have underestimated HRs. Moreover, TTM patients were compared with individuals without TTM from the same clinical database, many of whom had other psychiatric and/or physical diagnoses, rather than being truly healthy. This may have attenuated between-group differences in self-harm risk and limits the generalizability of our findings to truly healthy populations. In addition, in our previous study using hospital-based controls, we were able to demonstrate elevated self-harm risk in other psychiatric conditions, such as dissociative disorder [62]. Still, the age- and sex-matched approach ensured a suitable basis for comparison. Although matching controlled for demographic variables and multivariable Cox regression accounted for self-harm-linked conditions (e.g., depression and bipolar disorder), the low observed prevalence of these disorders among both TTM patients and comparators likely reflects underdiagnosis of psychiatric conditions [63]. In particular, the 5.3% prevalence of depressive disorders in the TTM cohort is lower than expected from the prior literature, suggesting that depression and other comorbidities may be under-recorded in this dataset. This might have resulted in an underestimation of their influence on the risk of self-harm and could obscure interpretations. Residual confounding might stem from unmeasured variables or inadequate adjustment for psychiatric comorbidity intensity. The CDARS captures only confirmed diagnoses lacking severity details and overlooks milder instances without hospital encounters, which is a typical drawback of administrative databases [64,65]. This issue can distort exposure effect estimates, either inflating or concealing causal associations [65]. Consequently, despite confounding adjustments, the findings offer only tentative support for causality due to lingering residual effects [65].

Moreover, as TTM is frequently diagnosed after a prolonged period of untreated symptoms [13], our index date may not reflect true onset, and time-to-event estimates may therefore underestimate the period of exposure and attenuate associations with self-harm.

We employed a comprehensive, broad definition of self-harm encompassing deliberate self-injurious behaviors with suicidal intent, self-injurious actions without suicidal intent, and both intentional and unintentional self-injurious acts. This definition was operationalized using ICD-9 external cause codes E950–E959 (intentional self-harm) and E980–E989 (injury of undetermined intent), which capture medically documented self-injurious events such as poisoning, cutting, and hanging. Hair pulling, the core symptom of TTM, is not classified within these code ranges and was identified using its own code (i.e., 312.39). Therefore, it was not counted as a self-harm outcome, nor were other potentially self-damaging behaviors (e.g., substance misuse, risky sexual behavior), which similarly fall outside these codes. As a result, our findings should be interpreted as reflecting clinically recorded self-injurious acts within the ICD framework, rather than the full spectrum of self-directed harmful or risk-taking behaviors. In a study on the risk of self-harm in psychiatric patients in Hong Kong, the sensitivity analysis showed that excluding undetermined self-harm (ICD-9 codes E980–89) did not markedly affect the results [66]. In addition, information on the interventions and treatments given to patients in our dataset was not available, which may have influenced the study results. The CDARS database recorded only suicidal actions, while the prevalence of suicidal ideation is likely greater than that the frequency of self-harm and may often go under-reported in clinical settings.

We sought to examine the relationship between the onset of TTM and subsequent self-harm behaviors. However, due to the unavailability of clinical records prior to 1993, it was not possible to confirm whether the earliest recorded diagnosis in the database corresponded to the true initial diagnosis of TTM. Furthermore, self-harm data were derived solely from medical records, which carries an inherent risk of under-reporting. Finally,

self-harm is a complex behavior influenced by multiple factors, such as demographic, social, economic, cultural, psychological, and environmental components [66]. However, due to limitations inherent in our data source, we were unable to account for these risk factors. Ideally, more comprehensive information on sociodemographic characteristics and lifestyle confounders should be collected and incorporated in future analysis.

A major strength of this study is the use of a territory-wide electronic health record database covering all public hospitals in Hong Kong over three decades, which enabled comprehensive case ascertainment and minimized selection bias. The matched cohort design, with equal numbers of individuals with TTM and comparison subjects, enhanced internal validity by partially controlling for key demographic and clinical characteristics. The application of Cox proportional hazards models allowed for appropriate time-to-event analysis while accounting for censoring and differential follow-up, thereby providing robust estimates of self-harm risk following TTM onset [67]. In contrast to prior work relying largely on cross-sectional or clinic-based samples to examine suicidal ideation and NSSI in TTM and related BFRBs [39,47], the current population-based longitudinal design represents a methodological advance that reduces vulnerability to referral and recall bias.

The finding that TTM was not associated with a significantly increased risk of self-harm suggests that hair-pulling disorder per se may be less purely impulsive than prototypical impulsive disorders. This is because hair-pulling commonly combines focused and tension-driven urges with automatic and habit-like acts outside full awareness [68], rather than predominantly rapid, consciously driven self-harm as in conditions such as borderline personality disorder [69]. These results may help refine clinical risk formulations for TTM by prioritizing hair-pulling-related distress, functional impairment, and treatment of common comorbidities such as mood and anxiety disorders over assuming an intrinsic self-harm propensity [16,70,71]. At the same time, given prior reports of elevated suicidal ideation and NSSI in some samples with TTM [47,72], clinicians should continue to conduct individualized assessments of self-harm and suicidality, particularly in patients with severe/chronic symptoms, or comorbidities strongly linked to elevated suicide rates such as major depressive disorder and borderline personality disorder [47,72].

5. Conclusions

In this population-based matched cohort study, individuals with TTM did not show a statistically significant increased risk of self-harm compared with matched controls. However, the small number of events and wide confidence interval suggest limited statistical power, and a clinically meaningful difference cannot be excluded. Further large-scale longitudinal studies with more comprehensive clinical characterization and improved capture of self-harm outcomes are warranted to clarify this relationship.

Author Contributions: W.K.T.: Conceptualization, Methodology, Data Curation, Statistical Analysis, Interpretation of Data, Writing—Original Draft, and Writing—Review and Editing; S.K.Y.C.: Writing—Original Draft and Writing—Review and Editing; K.K.F.T., T.C.F.Y. and V.W.J.L.: Statistical Analysis and Writing—Review and Editing. All authors report no conflicts of interest. All authors have read and agreed to the published version of the manuscript.

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Institutional Review Board Statement: This study was conducted in accordance with the Declaration of Helsinki and was approved by the Joint Chinese University of Hong Kong–New Territories East Cluster Clinical Research Ethics Committee, Hong Kong SAR, China (protocol code: 2020.707; date of approval: 9 April 2024).

Informed Consent Statement: Informed consent was waived because this study used anonymized secondary data from the Clinical Data Analysis and Reporting System (CDARS). No direct contact with individuals occurred. No individual-level patient information, personal identifiers, or sensitive personal data were available to the researchers.

Data Availability Statement: The data used in this study were obtained from the Clinical Data Analysis and Reporting System (CDARS) managed by the Hospital Authority (HA) in Hong Kong. Due to privacy and legal restrictions, data access is strictly controlled and limited to anonymized datasets, subject to HA approval. Data requests must be made through the HA's official channels. Requests to access these datasets should be directed to the Hospital Authority at <https://www3.ha.org.hk/data/Provision/ApplicationProcedure> (accessed on 10 November 2025).

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

Abbreviations

The following abbreviations are used in this manuscript:

TTM	Trichotillomania
CDARS	Clinical Data Analysis and Reporting System
ICD-9	International Classification of Diseases
HR	Hazard Ratio
CI	Confidence Interval
OCD	Obsessive–Compulsive Disorder
HRT	Habit Reversal Training
CBT	Cognitive–Behavioral Therapy
ACT	Acceptance and Commitment Therapy
FDA	The U.S. Food and Drug Administration
RCT	Randomized Controlled Trial
NSSI	Non-Suicidal Self-Injury
BRFB	Body-Focused Repetitive Behavior

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