

Article

Assessment of Care Transition of Post-COVID-19 Patients in Brazil: Association with Sociodemographic and Clinical Characteristics

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Abstract

Care transition comprises integrated actions that ensure individualized, multidimensional care and became especially relevant after COVID-19 due to complications, readmissions, and fragmented healthcare delivery. The aim this study was to assess care transition care quality for post-COVID-19 patients using the Care Transition Measure (CTM-15) and its association with sociodemographic and clinical variables. This cross-sectional quantitative study included 176 post-COVID-19 patients or caregivers from a Brazilian public hospital (2020–2021). Data were collected by telephone within 30 days after discharge using a sociodemographic/clinical questionnaire and the CTM-15. The results demonstrated that care transition quality was rated as satisfactory. The highest scores were observed in health management preparation and the lowest in understanding medications. Better evaluations were associated with younger age, higher income, influenza diagnosis, and non-smoking status, whereas diabetes and chronic obstructive pulmonary disease negatively influenced care plan scores. In conclusion, care transition quality was satisfactory and influenced by sociodemographic and clinical factors, highlighting the importance of individualized discharge planning.

Keywords: transition of care; post-discharge care; COVID-19; SARS-CoV-2; outcome and process assessment



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1. Introduction

The novel coronavirus, which began in December 2019 when the World Health Organization was alerted, was recognized as a pandemic in March 2020. It caused an overload on the global health system due to the high number of hospitalizations. It is estimated that approximately 14.9 million people died from the disease in 2020 and 2021. The public health emergency ended in May 2023 [1].

Although the pandemic is under control and there has been a significant reduction in deaths since May 2023, long COVID or post-COVID syndrome is a global concern. It affects millions of people, with an incidence rate ranging from 10 to 30% among non-hospitalized

individuals and from 50 to 70% among those hospitalized for COVID-19 [2]. Moreover, other complications may occur after hospital discharge: cardiovascular complications, including cardiac tamponade, acute myocardial infarction, ventricular failure, pericarditis, and myocarditis [3]; neurological complications, such as stroke, encephalitis, and neuropathies; motor difficulties and sequelae; pressure injuries; and other conditions such as the use of tubes, gastrostomy and tracheostomy [4].

Thus, the importance of continuity of care is highlighted, as is the need to reorganize the healthcare model. This model must focus on the individual and aim to promote quality care, patient safety, and the prevention of complications, unnecessary emergency room visits, hospital readmissions, increased costs, and mortality [5].

In this context, care transition (CT) is defined by the Australian Commission on Safety and Quality in Healthcare (2024) [6] as “when all, or part, of a person’s health care is transferred between care providers. This may involve transfer of responsibility for some aspects of a person’s health care, or all of their health care needs. It may be temporary to manage a brief illness or long-term due to a permanent change in healthcare status”. CT encompasses a set of actions and strategies that promote individualized, comprehensive care that considers the physical, psychological, emotional, social, and economic dimensions of human beings [5].

In order to promote safe and high-quality CT, some principles should be considered: individual-centered care, with clear and well-defined objectives and shared decision-making; multidisciplinary collaboration and communication, involving family member/caregiver; reliable and comprehensive record system for accessing and recording information; and coordination and continuity of care, with co-responsibility between patient, family member/caregiver, healthcare professional, and healthcare service [6].

During the pandemic, the transition from hospital to home required specific care from the healthcare team. This care included post-discharge follow-up, medication use monitoring, home health supervision, laboratory and radiological monitoring, and isolation discontinuation [7]. However, the overload caused by the high number of hospitalizations [8,9] caused the fragmentation of healthcare services, communication failure among professionals and deficient information to COVID-19 users and family members/caregivers, culminating in inefficient and unsafe CT and, consequently, in higher rates of adverse events and hospital readmissions.

Additionally, patients’ understanding of the guidance provided at discharge may be influenced by their clinical and sociodemographic characteristics. A review study demonstrated that patients with acute health conditions received various discharge instructions and were satisfied with them, while patients with chronic conditions had difficulty retaining the information. Furthermore, patients who did not involve family members and/or caregivers during the CT scan showed lower adherence to outpatient follow-up after discharge [10].

Although Brazil has a free health system, made up of a Healthcare Network with different degrees of complexity [11], there is no formalization of this line of care or policies on the topic, making it difficult to share information and care responsibilities [12].

Given the wide range of potential post-COVID-19 complications, adverse events, hospital readmissions, and the need for prolonged care after discharge, as well as the fragmentation of care within the healthcare system and the absence of well-defined policies and formalizations on the subject, this study is justified. Studies on this topic are relevant and have the potential to positively impact individual health and optimize healthcare services. They may also contribute to the implementation of future CT policies.

Given the above, this study aimed to assess CT quality for post-COVID-19 patients using the Care Transition Measure (CTM-15) and to examine its association with sociodemographic and clinical variables.

2. Materials and Methods

2.1. Study Design

This cross-sectional, quantitative study was carried out in a public hospital in southern Brazil and was guided by the STrengthening the Reporting of OBservational studies in Epidemiology guidelines [13]. This study is part of a macroproject entitled “Healthcare in hospital settings and the COVID-19 pandemic: management, care, labor, user safety and transition of care aspects, supported by the National Council for Scientific and Technological Development—CNPq”.

2.2. Population and Sample

The study population consisted of hospitalized patients with a diagnosis of or exposure to SARS-CoV-2, as well as their respective family members or caregivers. The sample was characterized as non-probabilistic. Patients who had been affected by or were family members/caregivers of a person affected by the virus, had been discharged from the hospital within the last 30 days, and were over 18 years of age were included. Patients who were discharged due to transfer or death were excluded.

2.3. Data Collection

Data were collected from patients discharged from a public hospital in southern Brazil after hospitalization for COVID-19. Patients were identified using a list of all hospitalizations between 1 November 2020 and 5 May 2021 with discharge, death, or transfer outcomes. After receiving training on the application of the CTM-15 and sociodemographic questionnaire, researchers from the macroproject contacted patients by telephone. All patients who answered the call and accepted the invitation participated in the study. Of the 1061 patients in the database, 397 died, 84 were transferred to other hospital units, 404 did not answer the calls, and 176 answered and agreed to participate in the study.

Sociodemographic and clinical variables of users were collected by instruments with 33 questions developed by the macroproject researchers. The CTM-15 has 15 items arranged in four factors: Factor 1—health management preparation (items 4, 5, 6, 8, 9, 10 and 11); Factor 2—understanding medications (items 13, 14 and 15); Factor 3—imported preferences (items 1, 2, and 3); Factor 4—care plan (items 7 and 12). Responses are measured using a Likert-type scale, containing the following options for each of the 15 items: “strongly disagree” = 1; “disagree” = 2; “agree” = 3; “strongly agree” = 4; “do not know/do not remember/not applicable” = 0 (the latter is not included in the score sum and should be analyzed separately) [14].

The score is calculated by adding the values corresponding to the answers and dividing that sum by the total number of questions answered. This result is then transformed into a linear scale from 0 to 100 using the following formula: $(\text{score} - 1) / 3^x \times 100$. Although there is no defined cut-off point in the literature, the higher the value, the better the quality and structure of TC. When interpreting the assessment, consider the scores of the four factors individually and the general mean [14,15].

2.4. Data Analysis

The sociodemographic and clinical variables were represented by absolute and relative frequencies. The CTM-15 items were represented by frequencies, as well as by mean and standard deviation. The four factors and the general factor calculated by the CTM-15 items were represented by the mean and standard deviation, as well as the median and interquartile range (median [P25; P75]), and the minimum and maximum. Cronbach’s alpha was also calculated for the four factors and the general factor to measure internal consistency. The means of the CTM-15 factors were compared using parametric tests between sociodemographic and clinical variables. The *t*-test was used to compare the

means of variables with two categories, and the one-way analysis of variance (ANOVA) was used to compare the means of variables with more than two categories. Considering the homoscedasticity or heteroscedasticity of the data, nonparametric tests were performed, such as the Mann–Whitney test or the Kruskal–Wallis test. A statistician assisted with the statistical analysis. The adopted significance level was 0.05. The analyses were performed using Statistical Package for the Social Sciences (SPSS) version 25.

2.5. Ethical Aspects

This study has ethical approval under Opinion 4,361,273 from the University Federal of Santa Catarina (UFSC) and received funding from the Santa Catarina State Research and Innovation Support Foundation.

2.6. Use of GenAI

The authors declare that no generative artificial intelligence (AI) tools were used to generate text or data, or to assist in study planning, data collection, analysis, or interpretation of results. Generative AI (ChatGPT version 5.5) was used only to generate the graphical abstract.

3. Results

This study included 176 users after hospital discharge due to COVID-19. Among the participants, 64.8% (*n* = 114) were aged between 21 and 59 years; 73.9% (*n* = 130) self-declared as white; 73.1% (*n* = 106) had a family income of 1 to 3 minimum wages; 86.1% (*n* = 149) were workers/retirees/pensioners; 98.9% (*n* = 172) were literate; and, of these, 50% (*n* = 88) had education up to the 4th grade of elementary school; 77.8% (*n* = 137) were married/in a common-law relationship; and 76.1% (*n* = 134) did not require hospitalization in an Intensive Care Unit. The distribution by sex (at birth) was heterogeneous, with 51.1% (*n* = 90) male and 48.9% (*n* = 86) female.

In the assessment of clinical variables, the predominant comorbidities prior to hospitalization were hypertension (38.7%), diabetes mellitus (DM) (33%), obesity (18.8%), and smoking (17.6%). Of the participants with comorbidities, 34% had one comorbidity; 19.9% had two comorbidities; and 10.9% had three or more. Among the participants, 71% were sedentary; 87.5% were hospitalized for the first time. Concerning the severity of COVID-19, 16.5% were considered moderate, 55.1% severe, and 21% severe.

Overall, CT quality received was considered satisfactory, with an average score of 70.53 ± 15.21 . The internal consistency of the CTM-15 was moderate, with a Cronbach’s alpha of 0.685. The analysis of the four factors of the CTM-15 revealed that the “health management preparation” factor had the highest mean score (72.58 ± 15.66), followed by the “imported preferences” factor (72.25 ± 18.50). The “care plan” factor had a mean score of 66.76 ± 22.84 , and the “understanding medications” factor had a mean score of 66.10 ± 21.01 , representing the lowest mean scores (Table 1).

Table 1. Measure of central tendency and dispersion of the Care Transition Measure (*n* = 176). Florianópolis, SC, Brazil, 2020–2021.

CTM-15	Mean (SD)	Minimum–Maximum	P50 [P25; P75]	<i>n</i>	Alpha *
General mean	70.53 (15.21)	22–100	71.11 [64.37; 80.00]	176	0.685
Health management preparation	72.58 (15.66)	29–100	71.43 [66.67; 80.95]	176	0.873
Understanding medications	66.10 (21.01)	0–100	66.67 [55.56; 77.78]	175	0.788
Imported preferences	72.25 (18.50)	22–100	77.78 [66.67; 88.89]	174	0.602
Care plan	66.76 (22.84)	0–100	66.67 [66.67; 66.67]	173	0.583

Source: Developed by the authors, 2025. * Cronbach’s alpha coefficient.

The analysis comparing CT quality assessment using the CTM-15 with sociodemographic variables revealed statistically significant differences for age ($p = 0.017$) and family income ($p = 0.029$). Patients under 70 years of age rated CT quality more positively than older patients. Patients with an income below one minimum wage rated CT more negatively, with the highest average among those earning more than seven minimum wages (80.6 ± 10.6). The individual analysis of the four factors and sociodemographic variables revealed statistical significance in the same two variables: age and family income (Table 2).

Table 2. Analysis of the relationship between the means of the Care Transition Measure factors and sociodemographic variables ($n = 176$). Florianópolis, SC, Brazil, 2020–2021.

Sociodemographic variables [n]	Overall CTM-15 Mean (SD)	Health Management Preparation Mean (SD)	Understanding Medications Mean (SD)	Imported Preferences Mean (SD)	Care Plan Mean (SD)
Sex ¹					
Male [90]	69.7 (14.1)	71.2 (13.7)	66.2 (20.3)	72.2 (16.5)	65.2 (22.3)
Female [86]	71.4 (16.3)	74.0 (17.4)	66.0 (21.9)	72.4 (20.5)	68.5 (23.4)
p value	0.453	0.244	0.932	0.945	0.346
Age ²					
From 21 to 59 [114]	71.6 a (12.4)	73.4 a (13.3)	66.7 (17.2)	74.1 a (14.7)	69.0 (19.5)
From 60 to 69 [31]	73.4 a (17.5)	76.1 a (17.9)	70.4 (26.4)	73.8 ab (22.6)	66.7 (23.2)
≥ 70 [31]	63.6 b (20.1)	66.0 b (19.5)	59.5 (26.4)	64.2 b (24.1)	58.3 (31.5)
p value	0.017 *	0.024 *	0.106	0.026 *	0.073
Marital status ¹					
Single/widowed/divorced [39]	69.5 (17.2)	72.7 (17.7)	62.4 (23.3)	69.0 (22.7)	67.1 (25.6)
Married/common-law relationship [137]	70.8 (14.6)	72.5 (15.1)	67.2 (20.3)	73.2 (17.1)	66.7 (22.1)
p value	0.636	0.959	0.213	0.222	0.917
Race ¹					
White [130]	70.6 (14.5)	72.6 (15.5)	65.3 (19.7)	72.7 (17.8)	67.4 (22.9)
Black/brown [46]	70.3 (17.2)	72.5 (16.4)	68.2 (24.5)	70.9 (20.6)	64.8 (22.8)
p value	0.922	0.958	0.422	0.562	0.507
Patient income ³					
No income [16]	66.3 (15.5)	65.5 (14.0)	64.2 (25.4)	68.8 (16.3)	67.7 (19.7)
<1 minimum wage [53]	69.2 (18.6)	71.7 (18.6)	64.4 (24.1)	71.6 (22.6)	63.8 (26.3)
1–3 minimum wages [89]	71.6 (13.1)	74.0 (13.5)	66.5 (18.9)	73.9 (15.8)	67.0 (21.7)
>3 minimum wages [8]	76.4 (9.8)	79.8 (13.9)	62.5 (13.2)	77.8 (13.3)	81.0 (17.8)
p value	0.492	0.188	0.869	0.671	0.352
Family income ³					
<1 minimum wage [8]	59.0 a (17.5)	60.9 a (16.3)	56.9 a (20.1)	55.6 (18.1)	56.3 a (29.5)
1–3 minimum wages [106]	72.6 ab (14.6)	74.4 ab (15.1)	69.1 ab (20.0)	75.4 (17.4)	67.1 ab (22.8)
4–6 minimum wages [23]	71.7 ab (7.9)	73.6 ab (9.5)	65.7 ab (12.9)	74.6 (11.2)	69.6 ab (13.9)
>7 minimum wages [8]	80.6 b (10.1)	85.1 b (13.1)	68.1 b (20.1)	76.4 (15.1)	88.1 b (15.9)
p value	0.029 *	0.028 *	0.222	0.071	0.034 *
Literate ⁴					
No [2]	68.7 (37.5)	71.4 (40.4)	66.7 (47.1)	77.8 (31.4)	50.0 (23.6)
Yes [172]	70.6 (15.1)	72.6 (15.5)	66.1 (20.9)	72.2 (18.5)	67.1 (22.8)
p value	0.971	0.983	0.937	0.817	0.337
Education ²					
Up to 4th grade [88]	70.9 (16.5)	72.6 (16.6)	67.7 (22.1)	72.1 (20.2)	68.2 (23.1)
5th to 8th grade [23]	68.7 (15.8)	71.6 (17.4)	67.2 (21.3)	69.6 (20.2)	58.3 (23.4)
High school [36]	68.2 (13.6)	70.2 (12.6)	61.1 (21.0)	72.5 (15.7)	63.3 (23.5)
Higher education [29]	73.8 (12.6)	76.5 (14.6)	66.7 (17.3)	74.5 (15.1)	73.2 (18.9)
p value	0.471	0.437	0.460	0.819	0.094
Remuneration ¹					
Does not work [24]	68.7 (15.6)	69.7 (17.2)	63.9 (20.0)	71.0 (19.5)	68.8 (20.4)
Worker/retired/pensioner [149]	70.9 (15.2)	73.2 (15.5)	66.4 (21.2)	72.5 (18.5)	66.7 (22.9)
p value	0.498	0.320	0.593	0.718	0.676

Source: Developed by the authors, 2025. ¹ Independent samples t -test. ² Analysis of Variance (ANOVA). ³ Kruskal–Wallis test. ⁴ Mann–Whitney test. SD: standard deviation; n : number; p value: significance level; *: p value < 0.05. Means followed by the same letters do not differ at the 5% significance level.

A statistically significant difference was found in the correlation analysis of clinical variables with CT quality according to the general mean of CTM-15 for influenza, DM, smoking, and physical activity. Those with influenza rated the CT as higher quality than those without the disease, in both the general mean ($p = 0.011$) and the means of the “health management preparation” ($p = 0.013$) and “imported preferences” ($p = 0.023$) factors. People with DM and smokers assessed the general mean of CT as lower quality ($p = 0.027$ and $p < 0.001$, respectively). The individual correlation assessment of the four factors revealed statistical differences between the “care plan” factor and DM ($p = 0.006$) and tobacco and the four CTM-15 factors (health management preparation [$p < 0.001$], understanding medications [$p = 0.005$], imported preferences [$p = 0.021$], and care plan [$p = 0.001$]) (Table 3).

Table 3. Analysis of the relationship between the means of the Care Transition Measure factors and clinical variables (n = 176). Florianópolis, SC, Brazil, 2020–2021.

	Overall CTM-15	Health Management Preparation	Understanding Medications	Imported Preferences	Care Plan
Sociodemographic variables [n]	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)
Influenza ³					
Negative [125]	70.7 (14.1)	73.0 (13.8)	64.8 (20.5)	72.4 (17.1)	69.1 (22.2)
Positive [10]	81.8 (12.5)	85.7 (15.3)	70.0 (18.2)	86.4 (21.4)	71.4 (18.5)
p value	0.011 *	0.013 *	0.531	0.023 *	0.889
First hospitalization ¹					
No [20]	71.6 (15.8)	72.7 (14.1)	66.9 (25.4)	74.4 (17.7)	70.0(23.3
Yes [154]	70.7(15.1)	72.8(15.8)	66.3 (20.4)	72.3(18.6)	66.7(22.8)
p value	0.795	0.966	0.892	0.620	540
Another hospitalization ⁴					
2nd hospitalization [12]	72.9 (17.3)	73.5 (19.3)	75.9 (22.1)	75.0 (19.6)	63.9 (23.4)
3rd hospitalization [9]	73.7 (15.1)	75.7 (16.4)	68.5 (22.2)	76.5 (20.4)	68.5 (22.7)
4th hospitalization [3]	74.1 (7.8)	76.2 (8.2)	63.0 (17.0)	77.8 (11.1)	77.8 (19.2)
5th hospitalization [1]	68.9 (0.0)	76.2 (0.0)	44.4 (0.0)	77.8 (0.0)	66.7 (0.0)
p value	0.989	0.991	0.447	0.993	0.816
Severity of COVID-19 ²					
Moderate [29]	72.3 (16.0)	75.4 (17.7)	65.9 (22.6)	73.2 (22.3)	67.3 (22.4)
Serious [97]	68.9 (14.3)	70.1 (14.3)	66.7 (18.9)	70.1 (16.9)	66.3 (23.7)
Severe [37]	69.5 (14.4)	72.5 (14.1)	60.5 (21.5)	73.4 (16.1)	66.2 (22.7)
p value	0.543	0.228	0.277	0.522	0.980
Inpatient sector ³					
COVID Unit [6]	70.0 (20.5)	73.0 (22.7)	77.8 (31.4)	66.7 (28.1)	55.6 (20.2)
Therapy Unit COVID Intensive [36]	69.8 (15.0)	73.4 (14.7)	60.0 (21.8)	72.2 (17.0)	67.1 (24.7)
p value	0.964	0.897	0.173	0.739	0.395
Hypertension ¹					
No [109]	71.4 (13.4)	73.0 (14.0)	67.5 (19.4)	72.8 (15.7)	68.8 (21.4)
Yes [67]	69.1 (17.8)	71.9 (18.1)	63.8 (23.3)	71.3 (22.4)	63.3 (24.9)
p value	0.342	0.654	0.266	0.595	0.126
Diabetes mellitus ¹					
No [118]	72.3 (15.0)	74.0 (15.5)	68.2 (19.9)	73.6 (18.3)	70.1 (20.2)
Yes [58]	66.9 (15.2)	69.8 (15.8)	61.9 (22.6)	69.4 (18.8)	59.9 (26.3)
p value	0.027 *	0.095	0.061	0.168	0.006 *
Chronic obstructive pulmonary disease ¹					
No [161]	71.0 (14.8)	73.1 (15.3)	66.3 (21.2)	72.6 (18.1)	67.9 (22.2)
Yes [15]	65.1 (18.9)	67.2 (18.4)	63.7 (19.9)	68.7 (23.0)	53.6 (27.1)
p value	149	0.163	0.646	0.449	0.024 *
Asthma ³					
No [172]	70.3 (15.3)	72.4 (15.8)	66.1 (21.1)	72.1 (18.7)	66.4 (22.8)
Yes [4]	78.3 (9.3)	81.0 (6.7)	66.7 (20.3)	80.6 (5.6)	83.3 (19.2)
p value	0.233	0.176	0.972	0.263	0.134

Table 3. Cont.

	Overall CTM-15	Health Management Preparation	Understanding Medications	Imported Preferences	Care Plan
Chronic kidney disease ³					
No [164]	70.0 (15.2)	71.8 (15.4)	65.5 (20.9)	72.1 (17.9)	66.9 (22.7)
Yes [12]	77.5 (13.8)	83.3 (16.3)	74.7 (21.7)	74.1 (26.5)	65.2 (25.2)
<i>p</i> value	0.112	0.041 *	0.194	0.501	0.860
Chronic heart failure ³					
No [164]	70.6 (14.9)	72.6 (15.4)	65.8 (20.6)	72.4 (18.1)	67.2 (22.4)
Yes [6]	70.1 (21.8)	72.2 (19.4)	64.8 (24.8)	74.1 (21.8)	66.7 (36.5)
<i>p</i> value	0.987	0.899	0.870	0.944	0.679
Obesity ¹					
No [137]	69.6 (15.3)	71.5(15.2)	65.1 (21.6)	71.3 (18.0)	66.9 (23.2)
Yes [33]	74.7 (13.7)	77.2 (15.7)	68.4 (16.5)	77.4 (18.2)	68.3 (21.6)
<i>p</i> value	0.080	0.056	0.423	0.085	0.759
Smoking ⁴					
Never smoked [139]	72.4 a (14.8)	74.4 a (15.1)	68.0 a (20.1)	73.9 a (18.1)	69.5 a (22.8)
Ex-smoker [27]	65.0 b (13.5)	66.9 b (14.8)	60.9 ab (20.1)	69.5 ab (17.6)	55.8 b (21.1)
Smoker [4]	46.1 b (14.0)	47.6 b (12.9)	22.2 b (11.1)	55.6 b (9.1)	45.8 ab (16.0)
<i>p</i> value	0.001 *	0.001 *	0.005 *	0.021 *	0.001 *
Physical activity ⁴					
No [125]	72.1 (14.8)	74.2 (15.0)	66.8 (21.5)	74.4 (18.0)	68.8 (23.7)
Yes [48]	66.4 (15.7)	68.1 (16.4)	63.8 (19.5)	66.9 (18.5)	62.4 (20.1)
<i>p</i> value	0.025 *	0.020 *	0.397	0.016 *	0.101
Physical activity frequency ⁴					
1x week [11]	51.8 a (12.8)	54.5 a (11.1)	50.5 a (26.0)	46.5 a (13.9)	51.5 (21.7)
2x week [17]	69.2 b (13.0)	70.9 b (15.0)	62.8 ab (13.9)	71.9 b (14.8)	66.7 (17.2)
3x or + [23]	71.8 b (14.9)	73.5 b (16.6)	72.0 b (16.7)	73.4 b (17.0)	63.0 (20.1)
<i>p</i> value	0.003 *	0.002 *	0.025 *	0.001 *	0.154
Number of comorbidities ²					
None [56]	72.0 (12.7)	73.0 (13.1)	69.6 (18.5)	72.3 (14.7)	70.8 (18.9)
1 comorbidity [60]	70.7 (15.6)	73.0 (15.7)	63.3 (21.7)	73.7 (17.8)	68.4 (23.9)
2 comorbidities [35]	67.6 (16.9)	69.8 (17.6)	61.9 (22.3)	69.9 (22.2)	63.3 (23.2)
3 or more [19]	71.5 (16.7)	74.8 (17.3)	69.0 (19.5)	73.5 (21.6)	58.8 (28.9)
<i>p</i> value	0.589	0.664	0.214	0.805	0.184

Source: Developed by the authors, 2025. ¹ Independent samples *t*-test. ² Analysis of Variance (ANOVA). ³ Kruskal–Wallis test. ⁴ Mann–Whitney test. SD: standard deviation; *n*: number; *p* value: significance level; *: *p* value < 0.05. Means followed by the same letters do not differ at the 5% significance level.

People who did not practice physical activity had a more positive assessment of the CTM-15 than practitioners ($p = 0.025$). Among practitioners, the group that exercised two to three times a week had the best assessment of the general mean ($p = 0.003$). No statistically significant difference was found in relation to the general mean of the CTM-15 in the chronic obstructive pulmonary disease (COPD) and chronic kidney disease (CKD) variables. However, the difference was significant in the individual assessment of factors between health management preparation and CKD ($p = 0.041$) and care plan and COPD ($p = 0.024$) (Table 3).

The number of hospitalizations, severity of COVID-19, hospitalization sector, hypertension, asthma, obesity, congestive heart failure and number of comorbidities did not show a significant relationship with TC quality assessment in any of the four factors (Table 3).

4. Discussion

This study assessed CT quality from the perspective of patients after hospitalization for COVID-19 or their family members/caregivers, through the CTM-15 and relate it to sociodemographic and clinical variables. Of the 176 individuals included in the study, the overall mean TC quality was satisfactory, with an emphasis on the “health management

preparation” and “imported preferences” factors. TC quality assessment showed a significant relationship with sociodemographic variables (age and income) and clinical variables (influenza, DM, COPD, CKD, smoking, and physical activity).

This study has several limitations. First, the data came from a single hospital. Second, the high non-response rate among eligible patients may have introduced selection bias, as the characteristics of non-respondents were not compared with those of participants. Third, the study was conducted during the pandemic. Fourth, the majority of the sample was made up of white, literate adults with life partners. Fifth, although the CTM-15 is a widely used instrument, its overall internal consistency in this sample was slightly below the conventional threshold, with lower internal consistency observed for Factors 3 (Preferences Important) and 4 (Care Plan). Therefore, these results should be interpreted with caution. Nevertheless, the research is relevant because it provides a situational diagnosis, identifying sociodemographic and clinical factors that influence TC quality. It alerts us to factors that pose the greatest threat to continuity of care and provides a basis for improving the transactional process.

A study conducted with users after discharge due to COVID-19 in a public hospital in northern Brazil found similar results related to TC quality assessment [16]. Another study in Canada examined the experiences of TC after hospitalization due to COVID-19. The study highlighted CT satisfaction with care in general, despite recognizing flaws in CT during the pandemic [17]. Users’ positive opinions may have been influenced by the initial context of the pandemic, the occurrence of many deaths, and gratitude for survival and for having received professional care despite overcrowded healthcare services.

The assessment of sociodemographic variables revealed that age and family income significantly influenced CT assessment. A similar study conducted in China assessed TC quality for elderly patients with chronic diseases from hospital to home using a different assessment instrument. That study identified significant associations with pre-retirement occupation, age, ethnicity, place of residence (rural or urban), monthly income, health status, and social support [18].

Our study did not find a statistical relationship between education level and CT assessment. This finding is consistent with another study of a population with chronic diseases, with an average age of 60.4 years, in which education level was also not statistically significant in TC assessment [19].

In contrast, other studies have found different results [16,20], showing that social determinants such as low health literacy, limited social support, difficulty navigating the healthcare system, and limited access to outpatient consultations influence CT and the excessive use of healthcare resources.

In this regard, a study carried out in the United States between 2019 and 2021 implemented a complex CT team program to ensure a successful transition from the hospital to the community. The program reduced hospital readmission rates from 51.2% to 22.0%, resulting in cost savings of more than US\$ 1 million [20].

Considering patients’ clinical variables, the most prevalent comorbidities prior to the onset of the pandemic were hypertension, DM, and obesity. This result aligns with those of other studies [7,16] in which these same clinical conditions were among the most prevalent prior to the onset of the pandemic.

Factor 1–Health management preparation

Of the four factors assessed individually, home health management preparation received the highest rating in this study. Hospital discharge preparation involves several aspects, especially for post-COVID-19 patients. These aspects include guidance on home care, warning signs and symptoms of possible complications, medication prescriptions, health education, and self-care [21].

In this context, nursing professionals stand out for their involvement with users and their family members throughout care, discharge planning, post-discharge monitoring, health education, and communication with other professionals and services [22].

Patients' anxiety and concern about returning home and failure to communicate with healthcare professionals can interfere with the understanding and comprehension of the instructions provided [21]. A recent study reinforces that poor communication during the hospital discharge process was identified as a cause of anxiety and stress in patients and their families [23]. Da Costa et al. (2019) [23] highlight the importance of communication skills for success, given the interprofessional nature of this strategy and the contact with different points in the care network it involves.

Thus, they emphasize that preparation for discharge is part of the comprehensive care process and must permeate the entire hospitalization. It involves the user/family as partners of the health team and uses a systematic and organized approach to the care process [11,21].

Factor 2—Understanding medications

Understanding medications had the worst assessment among the four CT factors. It refers to the ability to understand the pharmacological treatment that patients will follow at home. This ability is related to the prevention of undesirable medication errors that can lead to unfavorable outcomes. Patients with comorbidities who take continuous medications are at risk of having new medications added during the post-discharge period, which increases the risk of errors.

A study on medication reconciliation in TC of COVID-19 patients revealed that 92% of patients started at least one new high-risk medication during hospitalization, and 40% were discharged with a new high-risk medication started [24]. Another study involving patients with chronic non-communicable diseases showed that those who were affected by COVID-19 had a worse assessment of the "understanding medications" factor in CT [25].

From this perspective, it is important for the healthcare team to use techniques that verify patients' understanding of how to use new medications prescribed during hospitalization. One interesting technique is the "teach back" method, in which patients or caregivers are asked to repeat the information received. Pharmacists should also be involved in the CT process because they contribute to reducing the occurrence of adverse events in the post-discharge period by better describing changes in medication [26]. Hattingh et al. (2023) [27] suggest prioritizing patients starting high-risk medications to receive pharmacist assistance in CT.

Factor 3—Imported preferences

Respecting patient/caregiver preferences in decision-making for post-discharge care planning is essential to ensuring satisfactory adherence to care plans. One of the principles of effective CT is active user/caregiver participation in the CT planning process. This principle is included in one of CT's main components, patient engagement [28]. In our study, this factor received the second-best assessment among the CT factors. This suggests that the health team at the study institution recognizes the importance of patients and caregivers being central actors in their home care and practices patient-centered healthcare.

In a study carried out in the United Kingdom in the context of COVID-19 by Newman et al. (2023) [22], some healthcare professionals assessed the act of disregarding patient preferences in the discharge process as insensitive and ethically questionable, which can lead to low-quality care.

Factor 4—Care plan

Care plan guides post-discharge follow-up care, facilitates communication between healthcare levels, and must be understandable to users and/or caregivers. Studies assessing

CT in Brazil found similar results to ours [16,29,30], evidencing a weakness in hospital discharge planning.

Another study found that cancer patients attributed their low satisfaction with the care plan to a lack of specific care protocols, imperfections in the hospital discharge education process, a lack of reference caregivers, and a lack of continuity of primary care [31].

In general, discharge planning is carried out by the care team [32], which is already overloaded with care activities. This may contribute to the neglect of care plan, in our perception. Notably, some services have established hospital discharge offices to improve the discharge process, particularly for critically ill patients [33,34].

Given the complexity of factors involved in CT, it is evident that new strategies and initiatives are needed in this area of care. It is also necessary to reorganize nurses' responsibilities [35], and adjust this activity to ensure patient safety after discharge [36].

5. Conclusions

Considering the context of Brazilian healthcare, CT quality was assessed as satisfactory, showing a significant relationship with age, income, smoking, physical activity and diseases such as influenza, DM, COPD and CKD. Knowing these factors helps healthcare professionals to identify patients with greater vulnerabilities associated with TC and to promote individualized and higher quality care, avoiding possible complications, readmissions and death.

This study encourages new investigations to advance knowledge about CT, especially in populations with different clinical and social vulnerabilities. These investigations should also assess health literacy and its relationship with CT quality.

To improve the quality of care transitions, it is recommended to conduct a situational assessment of users' and family members' and/or caregivers' perceptions regarding continuity of care; to enhance communication between healthcare professionals and users; to apply techniques that verify users' understanding of medication use, such as the teach-back method; and to promote the active involvement of users in the care transition planning process.

The implementation of dedicated offices or units for hospital discharge management may be an effective strategy to enhance the quality of care continuity and improve patient safety.

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Abbreviations

The following abbreviations are used in this manuscript:

ANOVA	Analysis Of Variance
CKD	Chronic Kidney Disease
COPD	Chronic Obstructive Pulmonary Disease
CTM-15	Care Transition Measure
DM	Diabetes Mellitus
SPSS	Statistical Package for the Social Sciences
TC	Transition Of Care
UFSC	University Federal of Santa Catarina

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