




## **PSYCHOMETRIC VALIDATION OF THE CARE TRANSITIONS MEASURE (CTM-15) FOR BRAZILIAN USE IN HIGH-RISK PUERPERAL WOMEN**


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### **ABSTRACT**

**Objective:** To analyze the reliability and validity of the psychometric properties of the *Care Transitions Measure* scale for use in at-risk Brazilian postpartum women.

**Method:** This is a methodological study. Inclusion criteria: being hospitalized risk puerperal women, with access to a fixed or mobile telephone line after hospital discharge. A sociodemographic and clinical questionnaire and the Social Support Scale of the Medical Outcomes Study were applied at the bedside. Between seven and 30 days, the Care Transitions Measure was applied by telephone. The reliability of the scale was tested by Cronbach's alpha. The Chi-Square adjustment test and respective degrees of freedom were performed to test the proposed model. Exploratory factor analysis was performed to verify any possibility of factor structure.

**Results:** The Care Transitions Measure showed high internal consistency (0.902) overall and by factors. The four-factor model was statistically more adjusted when compared to the unifactorial model. The factor loadings showed values higher than 0.664, pointing to an effective contribution of each item. Also, when assessing the capacity for discrimination between the scales, the results showed a good capacity for discrimination.

**Conclusion:** The instrument presented valid and reliable psychometric properties to evaluate the transition of care from the perspective of at-risk postpartum women. The four-factor model was statistically more adjusted.

**DESCRIPTORS:** Transition of care. Continuity of patient care. Validation studies. Puerperium. Postpartum Period.

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## VALIDAÇÃO PSICOMÉTRICA DA CARE TRANSITIONS MEASURE (CTM-15) PARA USO BRASILEIRO EM PUÉRPERAS DE RISCO

### RESUMO

**Objetivo:** Analisar a confiabilidade e validade das propriedades psicométricas da escala *Care Transitions Measure* para uso em puérperas de risco brasileiras.

**Método:** Trata-se de um estudo metodológico. Critérios de inclusão: serem puérperas de risco internadas, com acesso a linha telefônica fixa ou móvel após a alta. Aplicados questionário sociodemográfico, clínico e a Escala de Apoio Social do *Medical Outcomes Study* à beira do leito. E por telefone, entre sete e 30 dias, aplicada a *Care Transitions Measure*. A confiabilidade da escala foi testada pelo Alfa de Cronbach. Para testar o modelo proposto, foi realizado o teste de ajustamento do Qui-Quadrado e respectivos graus de liberdade. Fez-se análise fatorial exploratória para verificar alguma possibilidade de estrutura fatorial.

**Resultados:** A *Care Transitions Measure* apresentou alta consistência interna (0,902) geral e por fatores. O modelo para quatro fatores se mostrou estatisticamente mais ajustado, se comparado ao unifatorial. As cargas fatoriais demonstraram valores superiores a 0,664, apontando para uma contribuição efetiva de cada item. Ainda, ao avaliar a capacidade de discriminação entre as escalas, os resultados apontaram boa capacidade de discriminação.

**Conclusão:** O instrumento apresentou propriedades psicométricas válidas e confiáveis para avaliar a transição do cuidado na perspectiva de puérperas de risco. O modelo para quatro fatores se mostrou estatisticamente mais ajustado.

**DESCRITORES:** Transição do cuidado. Continuidade da assistência ao paciente. Estudos de validação. Puerpério. Período pós-parto.

## VALIDACIÓN PSICOMÉTRICA DE LA MEDIDA DE TRANSICIONES DE CUIDADO (CTM-15) PARA USO BRASILEÑO EN MUJERES PÚPERAS DE ALTO RIESGO

### RESUMEN

**Objetivo:** Analizar la confiabilidad y validez de las propiedades psicométricas de la escala *Care Transitions Measure* para uso en puérperas brasileñas.

**Método:** Este es un estudio metodológico. Criterios de inclusión: ser puérpera de riesgo hospitalizada, con acceso a línea telefónica fija o móvil después del alta. Al pie de la cama se administró un cuestionario sociodemográfico y clínico y la Escala de Apoyo Social del Estudio de Resultados Médicos. Y por teléfono, entre siete y 30 días, aplicado a la Medida de Transiciones Asistenciales. La confiabilidad de la escala se probó mediante el Alfa de Cronbach. Para probar el modelo propuesto se realizó la prueba de ajuste chi-cuadrado y respectivos grados de libertad. Se realizó un análisis factorial exploratorio para verificar cualquier posibilidad de estructura factorial.

**Resultados:** La *Care Transitions Measure* mostró una alta consistencia interna (0,902) en general y por factores. El modelo de cuatro factores demostró ser estadísticamente más ajustado en comparación con el modelo de un factor. Las cargas factoriales presentaron valores superiores a 0,664, apuntando a una contribución efectiva de cada ítem. Aún así, al evaluar la capacidad de discriminación entre las escalas, los resultados mostraron una buena capacidad de discriminación.

**Conclusión:** El instrumento mostró propiedades psicométricas válidas y confiables para evaluar la transición del cuidado desde la perspectiva de la puérpera en riesgo. El modelo para cuatro factores fue estadísticamente más ajustado.

**DESCRIPTORES:** Transición del cuidado. Continuidad de la atención al paciente. Estudios de validación. Puerperio. Período posparto.

## INTRODUCTION

The postpartum period is a stage of pregnancy-puerperal cycle in which the physical regression of pregnancy occurs for the exercise of maternity. It is a period of transformations and adaptations, which begins after the dequitation of the placenta and ends around six weeks after delivery, with important repercussions that permeate women's lives up to one year postpartum<sup>1-2</sup>.

Although these transformations are physiological, interurrences may arise, and may become an at risk postpartum situation. Consequences can arise, such as severe cases and even death, if not identified and treated. It is a period that deserves qualified attention, in order to adequately stabilize the health of women, who undergo physical and emotional transformations. Thus, quality care in the postpartum period aims to maintain maternal health and act early if complications occur<sup>1-3</sup>.

Therefore, it is important that the team monitoring the postpartum woman receives a complete report from the hospital, about the birth and postpartum period, so that it can intervene early in adverse situations and schedule the routine of consultations and visits for the woman and the newborn, mainly, as mentioned, in cases of higher risk. In this sense, the home visit is an important tool to ensure a safe transition between the hospital environment and the home, and is a way to establish a greater bond, ensuring individualized access to the health of the postpartum woman, strengthening her self-care and that of the newborn, which helps in maternal empowerment<sup>4</sup>.

Thus, an effective care transition (CT) is necessary. CT is conceptualized as a set of planned practices, from the moment of admission to hospital discharge, in order to guarantee the coordination and continuity of care provided to patients. It is important when these patients undergo a change in their health or as they are transferred to health services that cover different levels of health care<sup>5</sup>.

Therefore, it is necessary to measure CT, which can be performed from the Care Transitions Measure (CTM-15) instrument, which aims to measure the quality of CT from hospital discharge at home or between different services. This instrument has been validated in several countries, with different populations<sup>6-11</sup>. The CTM-15 was validated for Brazil with patients with chronic diseases<sup>11</sup>, however, it does not apply to the specific population of at-risk postpartum or to postpartum women in general, which justifies the accomplishment of this study, which aims to analyze the reliability and validity of psychometric properties of the Care Transitions Measure Scale (MSC-15) for use in at-risk Brazilian postpartum women.

## METHOD

This is a methodological study, with a cross-sectional design, carried out in the maternity ward of a reference hospital for obstetric care, in Rio Grande do Sul, Brazil. Postpartum women with previous chronic diseases or those acquired during pregnancy and/or the postpartum period considered at risk, and who had access to a fixed or mobile telephone line after hospital discharge, were included. Those who did not have psychological conditions to respond were excluded.

To determine a representative sample, the parameters of good fit in the Confirmatory Factor Analysis were used as the basis for calculation. The adequacy of the model to the RMSEA (Root Mean Square Error of Approximation) adjustment measure was considered as the main parameter, which evaluates the discrepancy in the factorial models. Thus, starting from the model estimated in the validation of the CTM 15 in the normal population (four latent factors), the calculation of the sample size was performed using standard formulas for sizing samples in the analysis of structural models. The degrees of freedom of the model were considered, assuming a significance level of 5%, a power of 90%, as well as the hypothesis about the limits of the RMSEA. Thus, the result indicated a minimum size of 310 high-risk postpartum women. Calculations were performed using the G\*Power software for detection and effects on structural models.

Data were collected by two nurses and three scientific initiation fellows, previously trained by the study coordinator, who read and explained the items of each questionnaire, and answered questions concerning the instruments, ensuring uniformity in the collections, which occurred from November 2021 to June 2022. Postpartum women from 12 hours postpartum onwards were invited to participate in the study. After accepting, reading and signing the Free and Informed Consent Form, they answered the sociodemographic questionnaire and the Social Support Scale (SS) of the Medical Outcomes Study (MOS-SSS)<sup>12</sup>. The questionnaire of sociodemographic questions aims to characterize the participating population.

Furthermore, the participants were informed that they would receive a call between seven and 30 days after hospital discharge, to respond to the CTM-15<sup>5,11</sup> instrument. This instrument measures the quality of CT from hospital discharge at home or between different services<sup>5</sup> and has been validated for use in the Brazilian population<sup>11</sup>. It is composed of 15 questions, divided into four factors, which are: assured preferences - which asks whether the patient's preferences were considered to decide, for example, what is best for his health; preparation for self-management - which questions whether the patient obtained all the information necessary to take care of themselves, whether they received a discharge plan, whether he knows how to identify when he needs to seek help; care plan - understanding of the exams and follow-up appointments they should have; and understanding about the medications, that is, if you understood the medications you should use, the forms of use, schedule, among others<sup>5</sup>. As the CTM was applied by telephone and there was a possibility of losses, we invited six more patients to participate, totaling 316 women.

To calculate the means, the means obtained were transformed into scores from 0 to 100<sup>5</sup>. It should be noted that, for this study, authorization was requested from the original author of the scale<sup>5</sup> to change the term used "emergency service" to "maternity", which was consented by email.

The scale that assesses SS was used for divergent analysis. This was elaborated by the Medical Outcomes Study (MOS), validated for use in Brazil, which evaluates SS in a multidimensional way<sup>12</sup>. It consists of 19 questions, covering five dimensions: material, affective, emotional, information support and positive social interaction<sup>12</sup>.

The reliability of the CTM 15 scale was tested using Cronbach's Alpha ( $\alpha$ C). The analysis of the factor structure was performed by Confirmatory Factor Analysis (CFA), using the AMOS software version 20.0 (Analysis of Moment Structures). In order to test the model proposed in the literature, several goodness of fit indices were used: the chi-square fit test and respective degrees of freedom; Standardized Root Mean Square Residual (SRMSR), Tucker-Lewis Index (TLI), Comparative Fit Index (CFI), and RMSEA. The remaining analyzes were performed using the statistical data processing program Statistical Package for the Social Sciences (SPSS), version 25.0, for Windows.

MOS was used for discriminant analysis, with the CTM-15 instrument. An exploratory factor analysis (EFA) was performed in order to verify any possibility of factor structure for the CTM items. The Kaiser-Meyer-Olkin (KMO) sample adequacy test and Bartlett's test of sphericity were used. As for factor retention, eigenvalue  $> 1$  was used. Factor extraction was based on principal component analysis and Varimax rotation. The linearity relationship between the CTM and MOSS scales was studied using Pearson's correlation coefficient. The absolute fit indices used in the study were: Chi-Square ( $\chi^2$ ), GFI (Fitness-Fitness Index), RMR (Root Mean Square Residue), RMSEA (Root Mean Square of Approximation Errors). As for the incremental fit indexes, the following were considered: TLI (Tucker-Lewis Index), NFI (Normalized Fit Index), AGFI (Adjusted Goodness of Fit Index). Regarding parsimonious indices, the following were used: PGFI (parsimonious fit quality index), normalized chi-square ( $\chi^2/d.f.$ ), ECVI=expected cross-validation index.

This study complied with ethical precepts regarding research with human beings in accordance with Resolution 466/2012.

## RESULTS

There were 316 at-risk postpartum women participants, with a mean age of 27.9 years, ranging from 14 to 46 years of age. The prevalent level of education was complete high school (42.5%; n=134), followed by complete elementary school (33.7%; n=106). Regarding self-reported skin color, the majority declared themselves white/yellow (72.4%; n=223); and in marital status, married or living together, the was identified by 89.5% of the sample (n=282).

The total internal consistency of the scale was 0.902. When evaluated by factors, satisfactory estimates remained, as shown in Table 1. Regarding the possibility of excluding any question from the CTM-15, in order to improve the representation of the estimate, no critical issues were detected, both in the estimates for the total of the scale and for the results within each of the factors.

For the validation of the structure of the scale, the CFA was used, through the modeling of structural equations, seeking to reach the pre-established model of four factors. To adjust the model, the Maximum Likelihood Method (MV) was used to adjust the sample. Regarding the asymmetry of the distributions observed in the scale items, there was a lack of multivariate normality of the data, however, the Asymptotic Distribution Free and Bootstrap methods were used. Thus, it became feasible to obtain estimates very close to those indicated by the MV method.

According to the results, starting with the model's goodness of fit, it was verified that, for the absolute estimates, the model presented a significant result for the chi-square test (p-value=0.008),

**Table 1** – Measures of central tendency and variability for CTM-15 items and factors. Ijuí/RS, Brazil, 2022. (n=316)

CTM† Q‡	M§	DP	My.¶	Max.*	Percentiles			αC††
					25 <sup>th</sup>	50 <sup>o</sup> (Median)	75 <sup>th</sup>	
F1 - Preparing for self-management	72.7	17.0	4.8	100.0	66.7	66.7	85.7	0.883
CTM Q4	3.3	0.6	1.0	4.0	3.0	3.0	4.0	
CTM Q5	3.3	0.6	1.0	4.0	3.0	3.0	4.0	
CTM Q6	3.1	0.7	1.0	4.0	3.0	3.0	4.0	
CTM Q8	3.1	0.7	1.0	4.0	3.0	3.0	4.0	
CTM Q9	3.2	0.5	1.0	4.0	3.0	3.0	4.0	
CTM Q10	3.1	0.6	1.0	4.0	3.0	3.0	4.0	
CTM Q11	3.1	0.6	1.0	4.0	3.0	3.0	3.0	
F2 - Understanding of Medications	69.4	20.4	0.0	100.0	55.6	66.7	88.9	0.824
CTM Q13	3.2	0.6	1.0	4.0	3.0	3.0	4.0	
CTM Q14	3.2	0.6	1.0	4.0	3.0	3.0	4.0	
CTM Q15	2.8	0.8	1.0	4.0	2.0	3.0	3.0	
F3 - Assured preferences	65.6	20.4	0.0	100.0	55.6	66.7	77.8	0.863
CTM Q1	3.0	0.6	1.0	4.0	3.0	3.0	3.0	
CTM Q2	2.9	0.7	1.0	4.0	2.0	3.0	3.0	
CTM Q3	3.0	0.7	1.0	4.0	3.0	3.0	3.0	
F4 - Care plan	72.8	18.4	0.0	100.0	66.7	66.7	83.3	0.755
CTM Q7	3.2	0.6	1.0	4.0	3.0	3.0	4.0	
CTM Q12	3.2	0.7	1.0	4.0	3.0	3.0	4.0	

†Care Transitions Measure; ‡Question; §Mean; ||Standard Deviation; ¶Minimum; \*Maximum; ††Alpha Cronbach's alpha

pointing to discrepancies between the model proposed (estimated matrix) and the ideal model (observed matrix – real data) for the scale. In this sense, the ratio between the Chi-Square test and the degrees of freedom was used, where the value was 2.919, an estimate lower than 5, an acceptable fit of the four-factor model adjusted to the sample.

The RMSEA was 0.004 (95%CI: 0.001 – 0.009), indicating evidence that the model presents an acceptable absolute fit, that is, the model is able to adequately predict the observed correlation matrix. The RMR index also presented a satisfactory estimate for the proposed model (<0.05).

Incremental fit indices were considered, which refer to how a proposed model fits relative to an alternative reference model (null model). The calibrated Adjusted Goodness-of-Fit Index (AGFI) was initially evaluated, which represents the comparison between the squared residuals of the predicted model data and the actual input data (adjusted for degrees of freedom). In this sample, the proposed model presented AGFI of 0.933, which reached the recommended levels (>0.800). Thus, one must believe that the errors (differences) between the adjusted model and the model on the actual sample data were not representative.

Regarding the other incremental adjustment indices (GFI, NFI and CFI), also analyzing approximate adjustment criteria between the proposed model and a null model, the only estimate below 0.90 was for GFI (0.852), and the others indices (>0.90) indicated a satisfactory sample fit for the four-factor model. The Tucker-Lewis Coefficient (TLI), also considered a relative comparative index, which shows how much better the proposed model fits the data than the proposed model generated by Amos, the estimate approached the borderline parameter of 0.90, not representing a compromise of the proposed model.

According to the observed estimates for the quality adjustment indices, there is evidence that the model presented a good explanatory capacity. These multiple indices were used because each of them has different strengths and weaknesses to assess the adequacy of the confirmatory factorial model. It can be noted that the adjustment indices of the present study are, for the most part, in accordance with the cutoff values indicated in the literature, evidencing the general adequacy of the four-factor model (figure path diagram) and the satisfactory confirmatory factorial validity (Table 2).

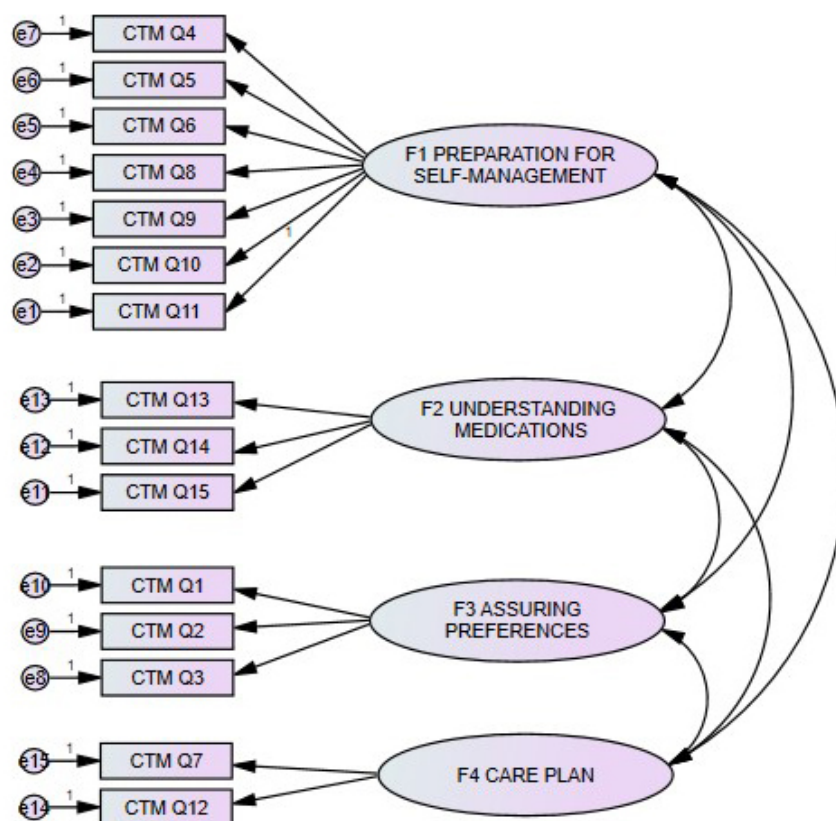
Considering the proposed model (Figure 1), the factor loads showed values greater than 0.664 (question 10), reaching a maximum of 0.891 (question 14), pointing to an effective contribution of each

**Table 2** – Quality of fit indices for the four-factor model MSC-15. Ijuí/RS, Brazil, 2022.

Suitability parameter	Confirmatory Factorial Models
	4 factors
Absolute adjustment index	
$\chi^2$	406.144 (p=0.008)
$\chi^2/g.l.$ (<5.0)	2.919
RMR (SRMR)	0.048 (0.057)
RMSEA	0.004 (CI95%: 0.001 – 0.009)
Incremental adjustment index	
GFI† (AGFI)	0.852 (0.933)
NFI	0.903
CFI	0.989
TLI	0.897

†GFI is a general coefficient of determination for models of structural equations. It is a value analogous to R<sup>2</sup> in multiple regression and indicates the proportion of variance-covariance explained by the model.





**Figure 1** – Path diagram for the CT M scale. Ijuí/RS, Brazil, 2022.

item in its referred factor. Regarding the correlations between the factors, these are characterized as moderate [F1 vs. F3:  $r=0.588$ ;  $p<0.001$ ] to strong [F1 vs. F4:  $0.707$ ;  $p<0.001$ ], indicating that the latent variables are concentrating different information from each other.

The robust structure evidenced by the CFA for four factors was confronted with the unifactorial model, since, according to the estimates presented in the internal consistency analysis, it was verified that the items did not show significant differences between the estimates.

Regarding the unifactorial confirmatory modeling, the results pointed to adequacy indices with lower quality, compared to the four-factor model. The absolute adjustment indexes RMR, SRMR and RMSEA presented values with lower quality, reaching 0.063, 0.082 and 0.076, respectively. The value was for the Chi-Square test divided by the degrees of freedom was 4.332, also less satisfactory than the estimate for the four-factor model. Regarding the incremental indices, the values for GFI (AGFI) NFI, CFI and TLI were 0.779 (0.802), 0.889, 0.901 and 0.733, respectively. All these estimates were below the acceptable cutoff points for an acceptable adequacy of the model. Regarding the parsimonious indices, the PNFI reached 0.524, while the PGFI was 0.622, that is, acceptable estimates, however, lower in quality compared to the results for the four-factor model. Thus, there is evidence that the four-factor model was statistically more adjusted compared to the one-factor model.

A comparison of the adjustment indices presented by the validation study for the general population<sup>5</sup> [2g.l.=3.403; SRMR=0.058; RMSEA=0.069; and CFI=0.990] was developed on the model as significant for this sample. When comparing the results with the sample of postpartum women, it was found that the fit indices remained satisfactory, or even showed a better fit for the model [2g.l.=2.919; SRMR=0.048; RMSEA=0.031; and CFI=0.989]. Thus, the CTM scale proved to be robust and consistent, for its distribution in four factors, both for the general population and for the postpartum women.

Seeking to identify another possibility of factorial structure, an exploratory factorial analysis was performed. In the analysis of sample adequacy for this technique, the result of the KMO test confirmed the adequacy of the data, with a value considered optimal (KMO=0.905), which indicated that the analysis of the data matrix was adequate for this sample. Regarding the analysis of commonalities (ranging from 0.492 to 0.861), extreme differences were not identified between the values of the items, indicating that the scale's data matrix presented favorable indexes for carrying out the factorial analysis. Still, complementing the analyses, the average of commonalities (0.723) indicated a good proportion of common variance between the items, demonstrating the suitability of the data to be submitted to factor analysis. The presence of intercorrelations between items was confirmed by Bartlett's sphericity test (Value 3.174.985;  $p < 0.001$ ).

Once the factorability of the data matrix was evidenced, the technique pointed to the formation of four factors, which statistically coincided with the pre-established structure for the CTM scale, with a proportion of explained variance reaching 72.3%. Factor 1 grouped items from 4 to 6 and 8 to 11, with loads ranging from 0.422 (item 8), reaching a maximum of 0.784 (item 5), and shared load was observed in items 8 (factor 1: 0.422 and factor 4: 0.305) and item 10 (factor 1: 0.508 vs. factor 4: 0.451). Fact 2 concentrated items 1 to 3, with loads ranging from 0.792 (item 3) to 0.838 (item 1). For factor 3, items 13 to 15 were listed, with factor loadings ranging from 0.474 (item 15) to 0.481 (item 13). And, for the last factor (4), items 7 (0.478) and 12 (0.521) stood out with less expressive but no less important factor loads. Thus, this result corroborates the findings evidenced by the CFA.

In the study of the discriminant validity of the CTM scale, the MOSS scale was used. This type of validity refers to the low and/or insignificant correlation with "opposite" variables, whose construct must be differentiated.

Good discrimination ability was identified in the comparison between the factors of the CTM and MOSS scales, identified by the low correlation coefficients detected. Although there were significant results, there is evidence that there is no overlap between the measures compared.

The highest correlation was detected between F1-Preparation for self-management and Information support ( $r=0.178$ ;  $p < 0.001$ ), a coefficient that characterizes a very weak correlation ( $r < 0.200$ ). Table 3.

**Table 3** – Pearson's correlation coefficient between the factors of the MOSS and MSC-15 scales. Ijuí/RS, Brazil, 2022.

CTM		MOSS				
		Material support	Affective support	Emotional Support	Information support	Positive social interaction
F1- Preparation for self-management	<i>r</i>	<b>0.150<sup>†</sup></b>	<b>0.070</b>	<b>0.163<sup>†</sup></b>	<b>0.178<sup>†</sup></b>	<b>0.130</b>
	<i>p</i>	0.007	0.215	0.004	0.001	0.021
	<i>r</i> <sup>2§</sup>	2.3%	0.5%	2.7%	3.2%	1.7%
F2- Understanding medications	<i>r</i>	0.05	0.045	<b>0.133<sup>‡</sup></b>	0.078	0.158
	<i>p</i>	0.061	0.425	0.018	0.167	0.005
	<i>r</i> <sup>2§</sup>	1.1%	0.2%	1.8%	0.6%	2.5%
F3- Assured preferences	<i>r</i>	0.049	-0.006	<b>0.126<sup>‡</sup></b>	0.058	0.118
	<i>p</i>	0.386	0.913	0.026	0.301	0.037
	<i>r</i> <sup>2§</sup>	0.2%	0.0%	1.6%	0.3%	1.4%
F4- Care plan	<i>r</i>	<b>0.135<sup>‡</sup></b>	0.087	0.149 <sup>†</sup>	<b>0.156<sup>†</sup></b>	0.149
	<i>p</i>	0.016	0.124	0.008	0.005	0.008
	<i>r</i> <sup>2§</sup>	1.8%	0.8%	2.2%	2.4%	2.2%

<sup>†</sup>The correlation is significant at the 0.01 level (2 ends);<sup>‡</sup>The correlation is significant at the 0.05 level (2 ends); <sup>§</sup>Coefficient of determination; *r*: Pearson's correlation coefficient



## DISCUSSION

Once the factorability of the data matrix was evidenced, the technique pointed to the formation of four factors, which statistically coincided with the pre-established structure for the CTM-15 scale. From the results it is possible to affirm that the CTM-15 instrument proved to be valid and reliable for the evaluation of CT in at-risk Brazilian postpartum women. It is similar when compared to the original study, which presented high internal consistency and reliability<sup>5</sup>.

Studies conducted in countries such as the United States<sup>5,13</sup>, Israel<sup>7</sup>, China<sup>8</sup>, Singapore<sup>6</sup>, Sweden<sup>10</sup>, Korea<sup>14</sup>, Japan<sup>9</sup> and Brazil<sup>11</sup> showed satisfactory internal consistency, with values ranging from 0.90 to 0.95.

When evaluating the possibility of excluding any question from the CTM-15 scale, in order to improve the representation of the estimate for internal consistency, no critical questions were detected, the factors were analyzed separately, reaching  $\alpha$ C: 0.755 to 0.883. Similar to the original version<sup>5</sup> which obtained  $\alpha$ C: 0.93, as well as with the version validated for Brazil<sup>11</sup>.

The CTM-15 scale proved to be robust and consistent for its distribution in four factors for the population of at-risk postpartum women, presenting even better quality of fit of the model, if compared to the original model<sup>5</sup>, and similar to the Swedish version, which maintained the four factors<sup>10</sup>. However, studies conducted in Israel<sup>7</sup>, Japan<sup>9</sup> and China<sup>8</sup> resulted in three factors. Specific characteristics of the countries may have contributed to this process, as in Israel, in which communication between services occurs through a discharge letter, so that the patient is delivered to the Primary Health Care (PHC) physician, thus uniting two items of the preparation factor for discharge in the factor understanding of medications<sup>7</sup>.

In the Japanese version, the items that had the lowest factorial load were integrated, such as confidence in self-management and understanding of self-management, but the item was maintained, as knowing about appointments and exams is important information for organizing continuity of care<sup>9</sup>.

In the Chinese version<sup>8</sup>, items 7 and 12 (having a written care plan and a list of appointments and tests), which originally belonged to the written and understandable care plan subscale, were incorporated into the health management preparation factor of the present study. The difference can be attributed to the different healthcare policy in mainland China and the US. In China, hospital discharge summaries are transmitted directly to patients, who are responsible for post-discharge illness prevention and health management. PHC physicians cannot obtain information about patients' hospital births until they visit community health centers. Furthermore, we found that items 13 to 15 (understanding the purpose, use, and side effects of medications) on the critical thinking subscale of the original measure belonged to a separate factor (medication management preparedness) in the translated version. This can be attributed to the fact that Chinese patients pay more attention to medication management than to other health behaviors such as diet and exercise after discharge<sup>8</sup>.

Among the correlated factors, factor 1 (preparation for self-management) presented the highest correlation. The other factors (understanding of medications, assured preferences and care plan) had a low correlation, when compared to the CTM, demonstrating little correlation between the factors, which shows that the CTM and MOSS scales do not measure the same information, being considered divergent scales.

With regard to the individual assessment of factors, preparation for self-management (factor 1) is related to understanding the guidelines provided to the patient and/or family member, as well as the attention and time spent to clarify doubts. This, which should start at the time of hospital admission, occurs, in most cases, at the time of hospital discharge, quickly, and may be ineffective and superficial<sup>15</sup>.

In the postpartum period, discharge information related to self-care is sometimes limited, since the care provided is more related to the care of the newborn, requiring professionals to also

direct their attention to the care of the woman, seeking to answer their questions, clarify about their health care, as well as the management of this new role in the family arrangement<sup>16</sup>. This research obtained a satisfactory average (72.7) for factor 1 (self-management). However, despite having obtained a high average, when analyzing the factor items, we identified that there were situations with lower averages, which denotes weaknesses in sharing information with patients to feel safe in self-management. Aspects that need to be considered by institutions.

The care plan factor obtained a satisfactory result (72.8). Referring to this factor is the discharge plan and referrals after hospital discharge, as well as the use of flows that contribute to the management of care, to facilitate the transition between health services at different levels of care, enabling the continuity of care<sup>17</sup>. However, there are still communication problems between services that are part of the health care network, especially with regard to referrals and/or subsequent follow-ups in the care network, which causes care to be fragmented after hospital discharge<sup>18</sup>. A Brazilian study with patients with chronic diseases showed, in the same factor, a result of (78.8), considered satisfactory<sup>17</sup>.

In factors 2 (understanding about the medications) and 3 (assured preferences) the scores were not satisfactory, being respectively 69.4 and 65.6, similarly to this same study conducted with patients with chronic diseases, which respectively obtained 69.0 and 69.718.

Difficulty in understanding medications may indicate that the information given to patients about side effects was restricted. Thus, one can point out that many patients understand the reason for using the medications, as well as the dosage, however, they do not know about the possible adverse effects<sup>17</sup>.

And, when considering patient and family preferences, it is important to consider and include the patient and family in care coordination decisions. This aspect is essential to promote self-management of care when the patient is discharged from the hospital. In this sense, it is necessary for the patient and his family to proactively assume care. And the nurse is responsible for promoting health education to those involved, helping in this process<sup>18</sup>.

Thus, it is evident that, for the transitions to happen, it is necessary to have the organization of the institutions, with professionals destined to this function, a qualified and committed team, with a continuous relationship with the patient, family and the entire care network, in order to connect the discharge planning and ensure the continuity of care<sup>16</sup>.

## CONCLUSION

The CTM-15 is valid and reliable for measuring CT in at-risk postpartum women. It demonstrated adequate CFA and psychometric properties, valid and reliable for use with this population, and may fill an important gap in knowledge, from the perspective of patients.

It is an instrument that will help hospital and PHC health teams to make safer and more effective care transitions, qualifying the health care of at-risk postpartum women. It will also have an important contribution to research, teaching and care, improving health practices.

Thus, future studies can be developed with a psychometrically validated instrument that measures the transition of care for at-risk postpartum women in Brazil, as this is a theme that is still little explored in our country.

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## NOTES

### ORIGIN OF THE ARTICLE

Extracted from the dissertation - transition of care from the perspective of at-risk puerperal women, presented to the Strictu Sensu Integral Health Care Graduate Program, of the Regional University of the Northwest of the State of Rio Grande do Sul, in 2022.

### CONTRIBUTION OF AUTHORITY

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### CONFLICT OF INTEREST

There are no conflicts of interest.

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