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FOCUS ON RESEARCH METHODS

Development and psychometric properties of an instrument to evaluate missed nursing care in home care: A validation study

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Abstract

Objective: To develop and validate a questionnaire to evaluate missed nursing care (MNC) in a home care setting.

Design: A new instrument was developed and tested performing a preliminary analysis of a multicenter cross-sectional study in Italy. Reporting was performed

according to COnsensus-based Standards for the selection of health status Measurement INstruments (COSMIN) guidelines.

Sample: Eight hundred out of a total of 2549 home care nurses enrolled in AIDOMUS-IT were considered for the validation of the Missed Nursing Care in Home Care (MNC_HC).

Measurements: The MNC_HC instrument was developed by a panel of experts and underwent content and face validation. Exploratory (EFA) and confirmatory factor analyses (CFA) were conducted.

Results: EFA revealed a one-factor solution, explaining 56% of the total variance for MNC_HC. CFA confirmed excellent structural validity, with a one-factor model showing an exceptional fit (χ^2 (27) = 141.39, $p < .001$, RMSEA = 0.04, SRMR = 0.04, CFI = 0.99, TLI = 0.99, factor loadings > 0.5). MNC_HC also demonstrated high reliability (Cronbach's $\alpha = 0.92$). The activity with the highest rate of missed care was the documentation of nursing care (77%), while activities related to nursing techniques (e.g., injections, dressings, etc.) were reported to be missed less (33.63%).

Conclusions: MNC_HC is a quick-filling, valid, reliable, and psychometrically sound instrument for measuring MNC in home care useful for future research.

KEYWORDS
AIDOMUS-IT, home care, instrument, missed nursing care, validation

1 | BACKGROUND

According to the World Health Organization (WHO), community health nursing should be an essential component of primary health services to ensure universal health coverage and avoid care inequalities (World Health Organization, 2017). In primary care, community health nurses, which include also home care nurses, should play a key role in health promotion, disease prevention, and management, and contribute to policy development for community health management (World Health Organization, 2017). The pivotal role of community healthcare and nursing has been shown to effectively address the spread of noncommunicable diseases and respond to the changing needs of the population (Kuhlmann et al., 2018). Considering also the "pressure test" that healthcare systems underwent worldwide during the COVID-19 pandemic, this role is even clearer (Scarpetta et al., 2021). In this regard, the re-arranging of community health services in Italy are being developed in Italy, given the recent enactment of the "Regulation establishing the models and standards for the development of community care within the Italian National Health Service" (Ministero della Salute, 2022). This will imply the restructuring of community care and the increasing integration of family and community nurses in the community care setting. However, this process needs to be informed by reliable data about the current state of the art and the identification of areas for improvement within community services in Italy. In this context, a multicenter cross-sectional descriptive observational study (AIDOMUS-IT) was conducted in Italy, aimed at mapping the characteristics of nursing community care management and the quality of home care (Bagnasco et al., 2023).

A secondary objective of the AIDOMUS-IT study was the description of missed nursing care (MNC) since this could be a valid proxy of the population's unmet needs and areas for improvement of community care. The WHO includes missed care among possible errors in healthcare. An error implies failure to perform an action as planned, or even the development of a wrong plan. Both during the planning and application stages, errors may occur "by doing the wrong thing" (i.e., commission) or "by failing to do the right thing" (i.e., omission) (World Health Organization, 2009). Missed care is an error of omission and, accordingly, MNC has been defined as "every care activity necessary for the patient, that is not provided or is seriously delayed" (Kalisch et al., 2009). The impact of MNC in community settings is mostly unknown since research on the topic is still limited although robust (Sworn & Booth, 2020). Considering research results, it is clear that MNC in community settings may have a severe impact on the populations' health outcomes, especially in older and complex patients (Sworn & Booth, 2020). In hospital settings, the association between missed care and patients' mortality has been highlighted in the literature (Griffiths et al., 2018); however, the type of health outcomes influenced by MNC seems to be related to different outcomes, such as long-term complications and increased care costs (Sworn & Booth, 2020).

When assessing MNC in home settings, it should be noted that in these contexts the nursing activities are different from those performed in hospitals. For instance, responsibilities like filing, ordering

supplies, answering phone calls, and scheduling appointments fall within the purview of home nurses, and the need to perform these tasks may lead to missed care (Phelan et al., 2018). Causal and influencing factors of MNC in home settings should also be considered and they include available economic and human resources, patients' acuity and complexity, workload, organizational factors (Sworn & Booth, 2020), and work environment perception (Senek et al., 2022). Assessing the latter in a huge cross-sectional study, conducted in home care settings, revealed an association between work environment perception and MNC, consequently impacting also on the quality of care (Zúñiga et al., 2015).

Given the importance of this issue for public health, the scientific community has recognized the need for validated and accurate instruments to evaluate MNC, leading to the development of several tools, which were first developed for hospital settings (Bagnasco et al., 2018). In home care and community settings, few instruments are available (Senek et al., 2022). A systematic assessment of MNC in these settings using a validated tool would enable us to explore its antecedents and consequences, as well as inform future policies. The questionnaire validated by Senek et al., 2022 was considered as a starting point to develop an instrument in Italian community settings for several reasons. It was derived from a validated questionnaire developed in 2018 (Phelan et al., 2018), which, in turn, was an adaptation of the validated missed care questionnaire by Kalish and Williams in 2009. This lineage ensures a thorough revision of the contents included in the tool. Additionally, its development was performed recently and is based on a specific conceptual framework firmly rooted in literature data.

2 | OBJECTIVE

The aim of this preliminary analysis of the AIDOMUS-IT database was to validate a revised version for the Italian context, of the instrument proposed by Senek et al. to assess MNC in home care settings.

3 | METHODS

3.1 | Design and participants

Between April and October 2023, a multicenter cross-sectional study was conducted in Italy (AIDOMUS-IT - Bagnasco et al., 2023) to evaluate the characteristics of nursing community care management and the quality of home care, including MNC as a secondary outcome. The study was conducted by the Italian Centre of Excellence for Research and Nursing Development-National Federation of Nursing Professionals Association (*Centro di Eccellenza per la Ricerca e lo Sviluppo dell'Infermieristica-Federazione Nazionale Ordini Professioni Infermieristiche*, CERSI-FNOPI). This was a preliminary analysis of the AIDOMUS-IT study and a validation study of a new instrument called Missed Nursing Care in Home Care (MNC_HC). The reporting of the process was checked against relevant items of the COSMIN (COnsensus-based Standards for the selection of health status Measurement INstruments) guidelines (Gagnier et al., 2021).

In the AIDOMUS-IT study, all the local health authorities (LHAs) in charge of managing home healthcare services in Italy were invited to participate in the study. Specifically, in Italy, home care is managed by an LHA that manages the care of patients in the community setting. There is a total of 110 LHAs that ensure the management of a specific district, identified according to the organization of the respective Region (Ministero della Salute, 2023).

Registered nurses providing home care or managing a home care service affiliated to LHAs that accepted to join the study were invited to participate. In each LHA a facilitator was identified to ease data collection. Specifically, the facilitator supervised the distribution of the link, which all the eligible nurses of that LHA could use to complete the questionnaire. The facilitators were adequately trained how to conduct data collection through virtual and/or in-person meetings by the principal investigator or other authorized members of the research team. The facilitators of each center invited nurses to participate through convenience sampling. For this preliminary analysis, we considered the minimum number of participants required for exploratory factor analysis (EFA), that is, 200 (Guilford, 1954; McNeish, 2017), and for the confirmatory factor analysis (CFA) the minimum number was tripled (i.e., 600). These participants were randomly selected from the total sample of the AIDOMUS-IT dataset (Bagnasco et al., 2024).

3.2 | Data collection and variables

Data were collected through an online questionnaire sent to home care nurses via email, containing a link to a secure access portal. Upon accessing the portal, nurses were provided with informative materials and the study questionnaire. By choosing to respond to the survey, participants confirmed their consent to participate in the study. It took only a few minutes for the nurses to complete the questionnaire, which was completely anonymous.

Among variables collected in the whole questionnaire related to AIDOMUS-IT study (Bagnasco et al., 2023), for this analysis, we considered nurses' sociodemographic and work characteristics (i.e., gender, age, level of education), attendance of educational courses in the field of home care nursing, years of practice (both in general and in home care setting), as well as MNC_HC scores. Moreover, considering the existing association between MNC and the work environment (Zúñiga et al., 2015), data related to the practice environment scale of the nursing work index (PES-NWI) (Lake, 2002; Zanini et al., 2022) were used to assess the construct validity of the MNC_HC.

3.3 | Instrument development

The questionnaire proposed by Senek et al. includes two sections, with questions regarding the last shift. In section A, respondents are asked whether they left care undone due to the lack of time, and those who reply "yes," are asked how frequently this occurs with regard to 11

nursing activities on a 4-point Likert scale (i.e., "rarely," "occasionally," "frequently," and "always"). The activities included: "Health promotion," "Administration" (e.g., report writing), "Screening," "Education," "Liaising with other health care professionals," "Educational (immunization advice, health advice, advocacy)," "Providing support to carers," "Providing support to families," "Fundamental personal/intimate nursing," "Technical nursing," and "Good communication". Section B includes five motivations for MNC: "Unanticipated rise in Patient Volume and/or Acuity," "Permanent Understaffing," "Additional Workload due to COVID-19", "Understaffing due to Sickness," and "Lack of Secretarial/Admin Support". Respondents are asked to rate the impact of the reasons for missed care on a 4-point Likert scale (from "no reason," "minor," "moderate," and "significant"). Results from both sections are provided through the frequencies of the answers to the Likert scales after dichotomizing answers by aggregating for section A, "rarely" and "occasionally" into "no/rarely missed care," and "frequently" and "always" into "yes/missed care"; for section B, "not a reason" and "minor" into "no," and "moderate" and "significant" into "yes" (Senek et al., 2022).

A panel of 10 experts of nursing organizations in home care translated into Italian and edited both sections of the instrument developed by Senek et al., 2022, according to the local context and known features of the phenomenon. The development followed an iterative process, by adding, modifying, or deleting items in both sections through online meetings. Thus, content and face validity were assessed by five experts working in a home care setting. Experts were selected considering the contribution and knowledge of the specific setting. The identified experts were invited to complete an online survey that included a general introduction describing the aim of the developed tool, and instructions on how to complete the online form. Experts' sociodemographic, educational, and work characteristics were collected, along with opinions on the MNC_HC items. In particular, raters were invited to read each question representing the item of the MNC_HC and evaluate its relevance, using a 4-point Likert scale ranging from 1 (totally irrelevant) to 4 (totally relevant); comprehensiveness, using a 4-point Likert scale ranging from 1 (not at all) to 4 (very much); and comprehensibility, using a 4-point Likert scale ranging from 1 (poor) to 4 (excellent). Moreover, a text box was available to collect any comments.

3.4 | Instrument description

The final section A Italian MNC_HC comprises nine items that measure how often nurses had to omit activities they deemed necessary due to the lack of time in the last week. This timeframe was chosen because it was hypothesized that assessing activities performed over the last week would more accurately reflect nurses' work compared to considering only the last shift. The expert panel considered the instrument developed by Senek for the development of item content and the Likert scale of the MNC_HC. Missed activities were evaluated using a four-point Likert scale, ranging from 0 (never) to 3 (often). Specifically, included items referred to nine areas: (1) technical nursing, (2) basic nursing/personal hygiene, (3) health education, (4) collaboration with other healthcare professionals to provide support to families, (5) providing support to caregivers, (6) disease prevention, (7) health promotion, (8) bureaucracy, and (9) communication and relationship. It is worth noting that one item related to nurses' activities related to students' education was not considered compared with what has been reported in previous studies (Phelan et al., 2018; Senek et al., 2022) because the expert panel did not consider this a relevant aspect for the topic and therefore not applicable. The final score was calculated considering the responses based on a Likert scale from 1 (hardly ever) to 3 (often) as the presence of a missed care and the response 0 (never) as the absence of missed care. Thus, the range of the final score was from 0 to 9. For missed care, nurses could indicate up to three reasons in section B, more than one answer was possible. Among those proposed by Senek et al., the following were selected considering the Italian context: "Absence of social care workers or other healthcare professionals," "Sudden increase in the number of patients or exacerbation of their conditions," and "Insufficient number of nurses to ensure adequate patient care." Results related to section B are provided in frequencies.

The PES-NWI is made up of 32 items organized in five dimensions, and the answers are given on a four-point Likert scale (1 = completely disagree; 4 = completely agree). Scores for each dimension are obtained by calculating the total mean value of the items included in the dimension (Zanini et al., 2022). In this study, only the dimensions of nurse manager ability, leadership and support of nurses (NMALS), and staffing and resource adequacy (SRA) were used to test the construct validity by comparison with the MNC_HC.

3.5 | Ethical consideration

This study was first discussed by the AIDOMUS-IT research group, composed of academic professors and researchers with an extensive curriculum in nursing and expertise in nurses' organizational well-being. The AIDOMUS-IT study obtained formal ethical approval (reference number 675/2022—Deliberation ID 12844) from the Ethical Committee of Liguria Region on 28/11/2022. Ethical principles regarding the protection of human subjects and the integrity of research were meticulously respected, in accordance with the Declaration of Helsinki. All participants were informed about the study's aims, procedures, potential risks, and benefits and provided informed consent before participation. Informed consent was shown to the participants in a written form and then, participants could read the informed consent displayed on the first page of the online survey and could access the survey only after accepting to provide their consent. Data confidentiality was rigorously maintained throughout the data collection and analysis processes. Participants' data were anonymized to protect their identities. Unique codes were randomly assigned by LimeSurvey to each participant who filled out the online survey, thus guaranteeing the anonymity of participants. Data were collected, stored, and processed in accordance with applicable data protection laws and regulations. Moreover, data were securely stored on password-protected computers and a secure server (without external access) owned by the National Nursing

Regulatory Board, with physical data kept in locked rooms. Access to data was restricted to authorized personnel only. Additionally, diligent efforts were made to minimize potential biases, conflicts of interest, and any form of research misconduct.

3.6 | Data analysis

Two researchers (M.D.N. and F.Z.) were involved throughout the data analysis process. The sociodemographic and work characteristics of the experts involved in the content validity phase were analyzed using descriptive statistics. Content analysis was performed for both sections of the scale. To assess content validity, the content validity index (CVI) for each item (I-CVI) was calculated. After collecting the responses from five experts, the relevance score (1–4) was dichotomized into two categories: scores 1 and 2, indicating irrelevant items, were re-coded as 0, while scores 3 and 4, indicating relevant items, were re-coded as 1. Then, the CVI was calculated for each item by summing all the relevant scores (coded as 1) and dividing the result by the number of experts interviewed. Moreover, the scale content validity index (S-CVI) was computed by combining all the I-CVI scores divided by the total number of items (S-CVI average). An I-CVI > 0.78 and an S-CVI > 0.90 were considered excellent (Lynn, 1986).

Sociodemographic and work characteristics of the nurses considered for structural validity, along with the reasons for missed care (section B of the MNC_HC), were analyzed using descriptive statistics. Structural validity was assessed only for section A of the MNC_HC. To assess the distribution of each item of the MNC_HC, the mean, standard deviation, skewness, and kurtosis of the score were calculated. The scale's validity was examined using the cross-validation approach (Xiong & Shang, 2016), which involves randomly dividing the sample into two subsamples. The homogeneity of the subsamples' sociodemographic and work characteristics was assessed using the Chi-square test for categorical variables and the *t*-test for independent samples for continuous variables. Subsample 1 was used to explore the psychometric properties of the MNC_HC using EFA, while subsample 2 was used to confirm its validity via CFA.

EFA was conducted using the maximum likelihood (ML) method. First, the suitability of factor analysis was assessed with Bartlett's test of sphericity and the Kaiser–Meyer–Olkin (KMO). Then, the EFA was performed to explore the underlying factor structure of the MNC_HC. To determine the number of factors to extract, the following criteria were applied: factor loadings > 0.30 with no cross-loadings, eigenvalues greater than 1 through scree plot visualization, interpretability of the factor structure (Thurstone, 1931), and the theoretical consistency of dimensions (Comrey & Lee, 2013).

Subsequently, in subsample 2, CFA was performed. First, multivariate normality was assessed with Mardia's test. In the case of non-normally distributed items, the robust estimator was used to confirm the scale's dimensionality. Adequacy of the measurement model was assessed using several fit indices, including Chi-square (nonsignificant), RMSEA (< 0.06), CFI (> 0.90), TLI (> 0.90), and SRMR (< 0.08) (Muthén & Muthén, 2012). The internal consistency of each factor was evaluated using Cronbach's α coefficient and item-total correlation. Factors with Cronbach's α values ≥ 0.70 were considered sufficiently reliable (Nunnally & Bernstein, 1994). The item-total correlation measures the relationship between a single item, and a whole scale score above 0.20 for each item is considered satisfactory (Kline, 1986). Pearson's correlation coefficient "*r*" was used to assess the construct validity of the MNC_HC to compare it with the NMALS and the SRA dimensions of the PES-NWI. Correlations ranging from 0.10 to 0.29 were categorized as weak, those from 0.30 to 0.49 as moderate, and values equal to or greater than 0.50 were considered strong (Cohen, 1988). Mean values and standard deviations (SDs) were calculated for the MNC_HC dimensions. The level of result significance was set at 0.05. Descriptive statistics analysis, EFA, and CFA were conducted using Jasp Statistics V. 0.18.1 and the "psych," "lavaan" and "semtools" packages in R (version 4.3.1).

4 | RESULTS

4.1 | Content and face validity

Experts involved in the content and face validity phases were mainly female ($n = 4$, 80.0%), had a mean age of 48.0 (SD = 7.6) years, had mostly a first-level master's degree ($n = 3$, 60.0%), and the mean number of years in practice was 24.2 (SD = 8.6). The I-CVI was excellent, whereby all the items were rated with the maximum score possible (i.e., 1). Consequently, the S-CVI for the total MNC_HC was perfect, with a value of 1.

Face validity was also confirmed, as the interviewed nurses reported that all the items were valid in terms of comprehensiveness and comprehensibility. One nurse reported a specific comment for item #2 that was analyzed by the expert panel, and it was considered "not relevant".

4.2 | Structural validity

4.2.1 | Participants

Out of the 110 health authorities we contacted, 71 accepted to participate, and 2549 nurses were included in the AIDOMUS-IT study. A total of 800 home care nurses were involved in this study. Nurses had a mean age of 46.5 years (SD = 10.6), were mostly female ($n = 639$ 79.9%), had a regional Diploma or a bachelor's degree in nursing ($n = 728$, 91.0%) but did not have a master's degree or a post-graduate professional course in home care nursing ($n = 579$, 72.4%). Moreover, nurses reported a mean of 22.3 years in practice (SD = 11.3) and a mean of 9.6 years in the home care setting (SD = 8.9). Overall, the sociodemographic and work characteristics of randomly selected subsamples were very similar (Table 1).

TABLE 1 The characteristics of home care nurses.

	Subsample 1 ($N = 200$)	Subsample 2 ($N = 600$)	Total ($N = 800$)	
	N (%)	*N* (%)	*N* (%)	*p*-value
Gender				0.731
Female	156 (78.0)	483 (80.5)	639 (79.8)	
Male	39 (19.5)	105 (17.5)	144 (18.0)	
Prefer not to say	5 (2.5)	12 (2.0)	17 (2.1)	
Education°				0.610
Regional diploma	83 (41.5)	273 (45.5)	356 (44.5)	
University diploma	14 (7.0)	33 (5.5)	47 (5.9)	
Bachelor	95 (47.5)	277 (46.2)	372 (46.5)	
Master's degree in nursing science	8 (4.0)	17 (2.83)	25 (3.1)	
Education in home care nursing	44 (22.0)	177 (29.5)	221 (27.6)	0.04
	Mean ± SD	Mean ± SD	Mean ± SD	
Age, years*	46.2 ± 10.6	46.6 ± 10.6	46.5 ± 10.6	0.685
Years in practice				
Total	22.1 ± 11.3	22.4 ± 11.4	22.3 ± 11.3	0.783
In home care setting	9.7 ± 8.8	9.5 ± 9.0	9.6 ± 8.9	0.775

Note: °Regional and university diplomas were the entry-level degrees for nurses until 1990 and 2001, respectively. *one case missing.
Abbreviation: SD, standard deviation.

TABLE 2 Descriptive statistics of the MNC_HC items in subsample 1 ($n = 200$) and subsample 2 ($n = 600$).

	Subsample 1 ($n = 200$)				Subsample 2 ($n = 600$)			
Item	Mean (SD)	Skew	Kurtosis	Loadings	Mean (SD)	Skew	Kurtosis	Loadings
1	0.52 (0.84)	1.55	1.39	0.58	0.5 (0.79)	1.48	1.29	0.54
2	0.81 (0.95)	0.86	−0.39	0.55	0.8 (0.96)	0.9	−0.34	0.56
3	0.98 (1.08)	0.71	−0.86	0.84	0.94 (1.03)	0.69	−0.83	0.83
4	1.04 (0.98)	0.52	−0.82	0.71	1.06 (1.01)	0.5	−0.94	0.75
5	0.97 (1.11)	0.66	−1.04	0.86	0.97 (1.09)	0.7	−0.9	0.87
6	1.11 (1.06)	0.45	−1.10	0.79	1.12 (1.03)	0.41	−1.06	0.80
7	1.11 (1.10)	0.49	−1.15	0.86	1.11 (1.06)	0.49	−1.03	0.88
8	1.51 (1.06)	−0.06	−1.23	0.61	1.51 (1.08)	−0.05	−1.27	0.65
9	1.18 (1.09)	0.41	−1.16	0.84	1.15 (1.07)	0.39	−1.16	0.83

Abbreviation: SD, standard deviation.

4.2.2 | EFA using subsample 1

Subsample 1 was used to perform EFA and to identify the underlying factor structure of the scale. Assumptions were tested with Bartlett's test, revealing significant sphericity (χ^2 (36) = 1148.89 $p < .001$), and the KMO value (overall KMO = 0.92) confirming that data were suitable for EFA. Descriptive statistics for the MNC_HC items in the subsample 1 are shown in Table 2. EFA was conducted to evaluate the dimensionality of section A of the MNC_HC. EFA produced a one-factor solution (eigenvalue > 1) that accounted for 56% of the total variance.

4.2.3 | CFA using subsample 2

Subsample 2 was used to perform CFA and thus to confirm the factor structure of the scale and its structural validity. Descriptive statistics of all the items included in the MNC_HC along with Skewness and Kurtosis are reported in Table 2. Results from the Mardia multivariate normality test were statistically significant (Skewness = 1032.90, $p < .001$; Kurtosis = 24.65, $p < .001$). Thus, robust procedures were carried out to deal with non-normal data. The correlation matrix indicated that all items had a fair ($r = 0.32$, items #2 and #8) to strong ($r = 0.79$, items #6 and #7) significant positive correlation.

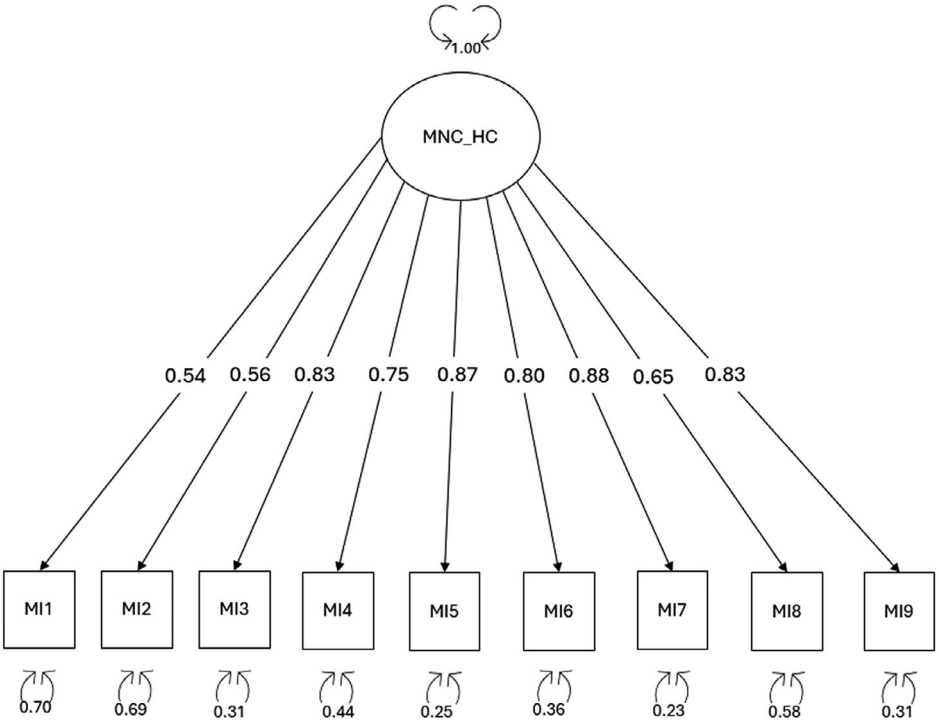

FIGURE 1 One-factor CFA model of the MNC in home care. MNC_HC, Missed Nursing Care in Home Care.

Regarding dimensionality, the fit indices showed an excellent fit using the one-factor model: χ^2 (27) = 141.39 ($p < .001$); RMSEA = 0.04 (90% CI = 0.04–0.05, $p = .886$); SRMR = 0.04, CFI = 0.99; TLI = 0.99. Factor loadings were all higher than 0.5, with a mean value of 0.77 (Figure 1). Concerning reliability, Cronbach's α coefficient was 0.92, showing excellent reliability. Item total correlation ranged from 0.53 (item #1) to 0.82 (item #7).

4.3 | Criterion validity

We performed Pearson's correlation to explore the relationship between the MNC_HC and the NMALS and SRA dimensions of the PES-NWI. This analysis yielded a weak negative correlation between the MNC_HC and both the NMALS ($r = -0.20$, $p < .001$), and a moderate negative correlation between the MNC_HC and the SRA ($r = -0.33$, $p < .001$).

4.4 | Missed care-related results

Considering the whole sample ($n = 800$) of nurses, a total of 89.87% ($n = 719$) reported a score between 1 and 9 (missing at least one activity in the last week) while among those, 23.23% ($n = 167$) reported a score of 9. The activity with the highest rate of missed care was the documentation of nursing care (Administration - item #9, 77%), while activities related to nursing techniques (e.g., injections, dressings, feeding tube changes, blood sampling, bladder catheter management) were reported to be missed less (Item #1, 33.63%). Regarding section B, most of the nurses ($n = 309$, 38.63%) reported that the main reason for the lack of time that led to missed care was due to the sudden increase in the number of clients or worsening of the patient's conditions (reason #1), followed by an insufficient number of nurses to ensure adequate patient care (reason #2, $n = 147$, 18.38%) and because of both these reasons ($n = 115$, 14.38%) (Table 3).

5 | DISCUSSION

The purpose of this preliminary analysis was to provide the scientific community with a valid and reliable instrument to evaluate MNC in home care settings. The relevance of the topic and its impact on the population's health is clear, especially considering worldwide epidemiological data and awareness raised during the COVID-19 pandemic regarding the main issues of the healthcare systems (Kuhlmann et al., 2018; Scarpetta et al., 2021; World Health Organization, 2017).

Overall, we showed that the MNC_HC was a psychometrically sound instrument for measuring MNC in home care settings, and robust results were obtained regarding scale dimensionality. In particular, the new instrument was developed considering international guidelines (Mokkink et al., 2019), after performing a deep analysis of the literature, including the consultation of previous missed care instruments, and involving a panel of experts in the field. Finally, the content and face validity of the MNC_HC were assessed by experts working in the home care setting and this was acknowledged as a highly valid, comprehensive, and comprehensible instrument. Although these results should be confirmed by further studies, they are particularly relevant for this instrument since it is a self-reported tool; its excel-

TABLE 3 Results obtained from each dimension of the MNC_HC.

Section A		
Instructions: missed care refers to nursing activities that have had to be omitted due to lack of time. Due to lack of time in your last week of work, with respect to the following areas, how often did you have to omit tasks that you felt were necessary?*		
Item number	**Item text**	**% of missed care**
1	Nursing techniques (e.g., injections, dressings, feeding tube change, blood sampling, bladder catheter management, patient assessments, change of infusion routes, pressure wound dressing)	33.63
2	Fundamental nursing/personal nursing (e.g., personal care, skin integrity care, etc.)	49.63
3	Health education (e.g., information on vaccinations, advice on healthy lifestyles, advice on how to access treatment, information on the correct administration and/or way of taking medications)	54.13
4	Collaborate with other professionals to provide support to families (e.g., following bereavement, family and/or marriage breakdown, etc.)	62.75
5	Provide support to informal caregivers	52.75
6	Disease prevention (e.g., use of screening tools/assessment scales to identify patient risks early and/or to support clinical choices)	63.5
7	Health promotion (e.g., healthy eating/rest and exercise, well-being and socialization)	62.38
8	Administration (e.g., report writing, filling in patient records, updating patient records, and other administrative tasks)	77.0
9	Communication and relationship (taking time to explain and listen to patients' and informal caregivers' concerns and answer questions)	63.63
Section B		
Instructions: reasons. Which of the following reasons led to lack of time?		
#	**Reason**	**% of reasons reported**
1	Absence of social care workers or other healthcare professionals	9.75
2	Sudden increase in the number of patients or exacerbation of their conditions	38.63
3	Insufficient number of nurses to ensure adequate patient care	18.38
1 and 2	Reasons 1 and 2	5.0
1 and 3	Reasons 1 and 3	3.0
2 and 3	Reasons 2 and 3	14.38
1, 2, and 3	Reasons 1, 2 and 3	10.88

Note: * = items are scored with a Likert scale from 0 to 3, where 0 = never, 1 = hardly ever, 2 = sometimes, and 3 = often. For each item, missed care was considered present when responders provided answers from 1 (hardly ever) to 3 (often).

lent content and face validity will maximally avoid misunderstandings and will ensure data homogeneity and comparability. Moreover, when focusing on item content, it is evident that they cover relevant contents of main areas of direct nursing care that should be provided within community and home care settings (World Health Organization, 2017), despite the adaptation of the MNC_HC content to the Italian context.

The adequate number of nurses included in the structural validity analysis and the rigorous methodology adopted ensured reliable results. Moreover, the wide coverage of data collection referred to the national territory and the homogeneity of the subsamples considered for EFA and CFA strengthened the reliability of the results. Exploratory and confirmatory analyses showed a unique factor detected through the scale, confirming that all items evaluate different aspects of MNC, with fair to strong item-to-total correlation and excellent reliability of the new tool.

Results related to the occurrence of MNC overlapped with those obtained in previous studies performed in community settings (Norman & Sjetne, 2019; Senek et al., 2022). In these contexts, nurses, in the event of a lack of time, tend to omit mostly administrative tasks (e.g., report writing, filling in patient records, and other administrative tasks) preferring to perform technical tasks (e.g., injections, dressings, feeding tube changes, etc.). Indeed, it seems that nurses perceive administrative tasks as those that impact less on patient's health, thus opting to leave undone these tasks rather than others. However, our results are in contrast with what was reported in the RN4CAST study conducted in Italy on hospital nurses (Bagnasco et al., 2020), where only 18.33% of the nurses reported omitting the documentation of nursing care. This contrasting result may be due to the different care settings. During home care, the need to travel between patients' homes could potentially lead to the oversight of documentation when time is limited. This may occur to prioritize essential patient care and adhere to the scheduled caring timeline.

Another interesting result concerns the reason why nurses experienced a lack of time and, subsequently missed performing care

activities. Among possible reasons, a sudden increase in patients or exacerbation of the disease was mainly reported (38.63%). This result could be due to the growing number of patients with chronic diseases (Holman, 2020), who may suffer from several symptoms that need more care (Yu et al., 2023). This finding is important for healthcare organizations, since in the home setting a correct nurse/patient relationship (also considering the geographic characteristics of the territory) can make the difference between adequate and inadequate care. Further studies need to explore the impact that MNC may have on patients' outcomes and the factors contributing to this phenomenon. Future research projects should consider that, unlike acute care settings, the consequences of MNC may be related mainly to long-term complications and care costs (Sworn & Booth, 2020). These insights are essential from a public health perspective, even considering the need for improved community care, as highlighted by the COVID-19 pandemic.

Despite the relevance and importance of what we obtained, the results of this study should be considered in light of some strengths and limitations. First, this was a secondary analysis of the first national study investigating the features and outcomes of Italian home care services and involving a considerable sample. However, the study implied a convenience sampling strategy and was cross-sectional, making it hard to investigate antecedents and consequences of the investigated phenomena.

6 | CONCLUSION

These results related to the AIDOMUS-IT multicenter cross-sectional study offer the scientific community a quick-filling, valid, reliable, and psychometrically sound instrument to measure MNC in Italian home care settings, although these results need to be confirmed also by other studies. Despite being customized for the Italian context, the MNC_HC includes relevant content on the main areas of direct nursing care in home care settings and received high consensus regarding its content from experts in the field.

Insights on the details regarding MNC may also be provided, although this validation did not include the whole sample of the study. It seems that most of the nurses in our sample missed at least one care activity per week, mainly regarding documentation activities. Instead, essential care tasks, such as nursing procedures, were ensured. Reasons for missed care included mainly clinical worsening of clients and, consequently, higher workload, and the lack of adequate staffing. Considering also that it is easy to use and quick to fill, the MNC_HC instrument is appropriate to be widely adopted in Italian homecare settings, to critically reorganize the specific contexts and identify local areas of improvement.

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CONFLICT OF INTEREST STATEMENT

The authors declare that they have no conflict of interest.

DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available from the corresponding author (V.C.), upon reasonable request.

ETHICS STATEMENT

This study protocol was approved by the Ethics Committee of Liguria Region (Ref. N. 675/2022 – Deliberation ID 12844).

PATIENT CONSENT STATEMENT

Not applicable. Participants were nurses who, by choosing to respond to the survey, confirmed their consent to participate in the study.

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