Nursing

Validity and reliability of the Home Health Care Survey of the Consumer Assessment of Healthcare Providers and System (HHCAHPS) tool: a multicentre cross-sectional study

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Keywords

Home care services • Nursing • Psychometric properties • Validation study • Satisfaction • Quality of health care

Summary

Introduction. *This study aims to investigate the psychometric properties of the Home Health Care Survey of the Consumer Assessment of Healthcare Providers and System (HHCAHPS) in the Italian context.*

Methods. *This is a secondary analysis of data from the AIDO-MUS-IT study. A total of 9,780 patients cared for by home healthcare services completed the HHCAHPS along with a measure of satisfaction for the care received. Structural validity was assessed with a confirmatory analytical approach (CFA). Construct validity was ascertained via hypothesis testing (convergent validity) by correlating the HHCAHPS scores with the scores derived from the measure of patient satisfaction for care. Internal consistency was assessed with the Omega (ω) coefficient.*

Results. *Structural validity was confirmed, with satisfactory fit indices of the CFA model specified according to the conceptualized three-factor structure ("care of patients", "communication with the providers", and "specific care issues"). Construct validity was confirmed with moderate correlations between the level of satisfaction for care and the factors "communication with the providers" ($r = 0.39$, $p < 0.001$), "care of patients" ($r = 0.34$, $p < 0.001$), and "specific care issues" ($r = 0.19$, $p < 0.001$). Internal consistency was satisfactory for the "specific care issues" factor ($\omega = 0.81$), while it was at the threshold of acceptability for the other factors ($\omega = 0.60$-0.62).*

Conclusions. *This study shows that the HHCAHPS is valid and sufficiently reliable when tested on the Italian population. Therefore, this tool can be supportive for promoting research and designing interventions to promote patient-centered care within home healthcare settings.*

Introduction

Healthcare quality has increasingly attracted the attention of health managers and policymakers worldwide [1, 2]. This expanding focus is largely due to the recognition that improving healthcare quality leads to better patient outcomes, provides a competitive edge, and ensures long-term financial sustainability [2]. In view of the increasing demand for personalized and continuous care outside hospitals, it is especially important to assess and ensure the quality of services provided in home care [3, 4]. This demand is largely driven by demographic changes and shifting epidemiological patterns, which underscores the need for a more tailored, patient-centered approach to care [5].

Although objective indicators such as mortality and morbidity rates remain essential, patients' perceptions also play a crucial role in evaluating the quality of healthcare services [1-6]. Patient experience in particular has become an important quality indicator in various areas of healthcare, as it helps to determine whether services are effectively tailored to patients' individual needs and to assess the extent to which patients are actively involved in their care and recognized as partners [7]. In addition, several

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studies have consistently shown that a positive patient experience is strongly related to clinical effectiveness, patient safety, and health-related behaviors [7, 8]. These behaviors include adherence to prescribed medications, participation in screening programs, and efficient use of health resources across various medical conditions, care settings, and population groups.

Various efforts have been made to develop conceptual models and assessment tools that can be used to measure the multidimensional nature of overall service quality [9]. For example, Brady and Cronin [10] developed a third-order factor model for assessing service quality. This hierarchical model emphasizes that overall service perception is shaped by customer interactions, the environment, and tangible outcomes. Subsequently, Dagger and colleagues (2007) refined the framework by developing and validating a four-domain hierarchical model through a mixed-methods study. In this model, service quality is described as a combination of the interaction between the provider and the user, the provider's technical expertise, the environmental factors that influence both service and consumer perception, and the effectiveness of administrative processes.

Based on these conceptual models, specific tools were developed to assess the perceived quality of healthcare services, including the Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS). The HCAHPS is a well-known and internationally validated tool for evaluating patients' experiences with hospital care [12, 13]. The original instrument consists of 33 items distributed into 6 domains: "physician communication," "pain management," "discharge planning," "nurse communication," "physical comfort," and "drug communication." Building on the success of HCAHPS, the Home Health Care Survey of the Consumer Assessment of Healthcare Providers and Systems (HHCAHPS) was developed to assess patient experiences in home care. The instrument was developed by the Centers for Medicare & Medicaid Services (CMS) in collaboration with the Agency for Healthcare Research and Quality (AHRQ) [14] and consists of 34 items designed to assess specific dimensions of care quality, including access to care, communication with healthcare professionals, and interactions with home health agencies (HHAs) and their staff. The survey also includes two global rating measures that evaluate the overall care quality and the willingness to recommend the organization to family and friends. To gain a comprehensive understanding of patient experiences, the HHCAHPS also integrates demographic information and self-reported health conditions.

Home care is increasingly recognized as a key component of healthcare systems worldwide, as a result of demographic, epidemiological, and economic changes [15]. In this context, a standardized assessment tool such as HHCAHPS could play a crucial role in evaluating the quality of home care services. However, despite its widespread use, the psychometric properties of HHCAHPS have not yet been assessed. This gap raises concerns about the applicability and accuracy of the tool in capturing patients' experiences in this specific context.

Therefore, our study aims to investigate the psychometric properties of HHCAHPS in the Italian home care system. Our research can contribute to understanding home care settings by validating a tool to measure patients' perceptions of the quality of care and, thus, optimising care practices and ensuring a more patient-oriented approach to home care. Additionally, a well-validated tool could enable home care providers to identify areas requiring improvement, refine service delivery, and monitor the impact of care interventions over time.

Methods

Study design

This is a validation study of the Home Health Care Survey of the Consumer Assessment of Healthcare Providers and System (HHCAHPS), which has been translated into Italian and adapted to measure the care satisfaction of patients cared for in home care settings. This study is part of the Home Nursing Care in Italy (AIDOMUS-IT) project [4]. In Italy, home care is managed by local health authorities (LHAs). These are public agencies that are responsible for managing and providing health services within designated districts or areas, which typically correspond to provinces. LHAs coordinate primary care services provided by various healthcare professionals (*i.e.,* general practitioners, family nurses, and district nurses). The COnsensus-based Standards for the selection of health Measurement INstruments (COSMIN) reporting guidelines were used to ensure accurate and reliable reporting [16].

Data collection

The data used for this validation study comes from the AIDOMUS-IT dataset, collected from April to October 2023. Specifically, an online survey was administered to patients cared for by the participating LHAs at a single point in time. The survey was disseminated by home care nurses on paper or via a web-based questionnaire. For the latter, a QR code was used to access a secure link to LimeSurvey®. When accessing this web application, participants were required to view the informational materials and the respective informed consent. After providing their consent, patients were allowed access to the survey. In case the patient wanted to complete the paper-based questionnaire, a written informed consent was signed before commencing. The questionnaire included an adapted version of the HHCAHPS.

Measurement tool

The original HHCAHPS is composed of 34 items divided into four sections: 1) your home health care; 2) your care from home health providers in the last 2 months; 3) your home health agency; and 4) about you. Moreover, 10 supplementary items are available [14]. This tool can be used to calculate three composite measures: 1) "care of patients" (items Q9, Q16, Q19 and Q24); 2)

"communications between providers and patients" (items Q2, Q15, Q17, Q18, Q22, Q23); and 3) "specific care issues" (items Q3, Q4, Q5, Q10, Q12, Q13 and Q14).

Each item of the first three sections of the HHCAHPS have a dichotomous response (*e.g.,* yes or no, item Q2), a Likert-type response (*e.g.,* from never to always, item Q9) or a numeric rating scale response (*i.e.,* from 0 to 10, item Q20). In the AIDOMUS project, this tool was adapted considering the aim of the project and target population and their specific characteristics. Items of sections one, two and three were referred to nurses' activity instead of the activity related to the agency, as the aim of the AIDOMUS project was to assess the quality of care received by nurses. Section 4 (sociodemographic characteristics) were adapted considering the Italian context (*e.g.,* Q29 was adapted considering the school levels available in Italy). Items Q12, Q30, Q31 and Q32 were not considered as they were not adequate for Italian home care. Moreover, supplemental items S1, S2, S5, and S8 were added to the survey. Items S2 and S8 were revised to include additional response options. Item S2 included the following response options: "after discharge from a hospital"; "after discharge from a private or affiliated nursing home"; "after discharge from a rehabilitation facility"; "upon request by your general practitioner". Item S8 included the following response options: "I am still waiting for the problem to be resolved"; "not satisfied at all"; "somewhat satisfied"; "fairly satisfied"; "satisfied"; "very satisfied". These changes were made to more accurately capture the specific reasons for home care enrollment and to better assess patients' satisfaction with how the nurses resolve their problems. Item Q16 ("How often did nurses from this agency treat you as gently as possible") was removed and replaced with S5 ("How often did you feel that nurses from this agency really cared about you") as Q16 was similar to Q19 (How often did nurses from this agency treat you with courtesy and respect).

After revising the instrument, face and content validity [17] were assessed involving five experts working in the home care setting. Face and content validity were investigated by means of a group of experts through an online survey. Their responses were collected with their sociodemographic, educational, and occupational details. Experts were asked to read each item of the HHCAHPS and to assess its relevance using a Likert scale from 1 (totally irrelevant) to 4 (totally relevant), while comprehensiveness and comprehensibility were assessed through text comments.

Item S8 was used to test convergent validity of each of the three composite measures of the HHCAPS. Responses were transformed in a numeric rating from 1 (Not satisfied at all) to 5 (Very satisfied), excluding the response "I am still waiting for the problem to be resolved". Higher values of item S8 indicated higher levels of satisfaction.

Data analysis

Sociodemographic and clinical characteristics of the sample are described with means (SD) and absolute frequencies (%). Response categories of the items are presented as absolute frequencies (%). The Content Validity Index (CVI) for each item (I-CVI) was calculated to assess content validity. The relevance ratings, originally on a scale from 1 to 4, were grouped into two categories: scores of 1 and 2 (indicating irrelevance) were recoded as 0, while scores of 3 and 4 (indicating relevance) were recoded as 1. The I-CVI for each item was then computed by dividing the number of experts who assigned a relevant score (coded as 1) by the total number of experts. Additionally, the Scale Content Validity Index (S-CVI) was obtained by averaging all I-CVI scores across items. Content validity was considered excellent if S-CVI exceeded 0.90 and I-CVI was greater than 0.78 [18].

Regarding the factorial structure of the tool, it was postulated to be composed of three latent factors, representing the composite measures reported by the HHCAHPS website [14]: "care of patients" (Q9, S5, Q19, Q24), "communication with the providers" (Q2, Q15, Q17, Q18, Q22, Q23), and "specific care issues" (Q3, Q4, Q5, Q10, Q12, Q13, Q14). Item S5 was considered an indicator of the first composite measure as its structure and meaning is very similar to that of item Q16. We used a confirmatory factor analysis (CFA) to investigate the structural validity of the scale. The HHCAHPS was also composed of two global items (Q20 and Q25) representing a rating and a recommendation regarding the home care services. Thus, these items were not included in the CFA. Since the items of the HHCAHPS are ordinal in nature, we used a categorical estimator (ULSMV) to derive the parameters [19]. The following fit indices were used to judge model fit: chi square (χ 2), comparative fit index (CFI; values > 0.90 are considered satisfactory), Tucker-Lewis index (TLI; values ≥ 0.90 indicate satisfactory fit), root mean square error of approximation (RMSEA; values ≤ 0.05 indicate good fit), and standardized root mean square residual (SRMR; values ≤ 0.08 are indicate good fit). Item factor loadings ≥ |0.30| were considered adequate to confirm their related latent factors. Internal consistency reliability was computed with the Omega coefficient (with values ≥ 0.70 considered adequate). This index was computed for each latent or composite factor. Construct validity was assessed by hypothesis testing. Specifically, we hypothesized that each composite measure of the HHCAHPS was positively correlated with the level of satisfaction for the care received (convergent validity). This validity was confirmed if Pearson's correlation coefficient was statistically significant. All the descriptive statistics were computed with SPSS® v. 25 (IBM corp. Released 2017). The CFA was performed with MPlus® v. 8.9 [20].

Results

Content validity

Five experts were recruited for the content and face validity process. The experts were all nurses with

valuable experience in home care, mainly female (n = 4, 80%), had mean age of 47.8 (SD = 7.5) years, mostly had a Master of Science in Nursing (n = 3, 60%), reported a mean number of 24.4 years (SD = 8.6) years of experience in the field and worked mostly as nurses with organizational tasks (n = 4, 80%). Regarding face validity, no comments were reported on comprehensibility. Regarding content validity, I-CVI ranged from 0.80 to 1 with an average S-CVI of 0.93.

Characteristics of the sample

A total of 9,780 patients completed the questionnaire. The patients had a mean age of 75.32 years (SD = 14.61), the majority were male (57.57%), most participants had secondary school education (50.51%), cohabited with a family member or caregiver (80.57%) and almost all patients were Italian (95.84%). Most of patients perceived their health to be sufficient (38.99%), while the majority rated their mental/emotional health as good (38.31%). Home care was most frequently activated upon the request of a general practitioner (49.83%). Satisfaction with home care was generally high, with 57.16% of participants reporting being very satisfied with the service. Table I reports the sociodemographic and clinical characteristics of the sample.

Structural validity and internal consistency

Table II reports the descriptives of the items of the HHCAHPS. In summary, patients predominantly reported that the nurses cared for them in a professional way (the "always" option was endorsed by 70.1% to 91.4% of the respondents). They also reported that the nurses communicated well with them (the "always" option was endorsed by 81.3% to 82.9% of the respondents), and that they discussed with them about medicines, pain, home safety, and information (the "yes" option was endorsed by 60.9% to 91.2% of the respondents, except for Q13 and Q14). Finally, most patients (98.7%) rated their care at least 6 to 10 points, and 78.9% of them wanted to recommend the agency to their family or friends.

The initial CFA performed considering the three composite measures yielded partially satisfactory fit indices: x^2 (120, N = 9,779) = 7,975.32, $p < 0.001$; RMSEA = 0.027 (90% CI = [0.025, 0.029]; p (RMSEA < 0.05) = 1.00); CFI = 0.91; TLI = 0.89; SRMR = 0.089. An inspection of the modification indices showed that the largest index (389.99) pertained to Q2 loading to the "specific care issues" composite measure. Since this loading can be reasonable (*i.e.,* patients are likely to consider the information on care and services as other different aspects of care issues) this modification index was accommodated. After moving Q2 from "communication with the providers" to "specific care issues" composite measure, the fit of the model improved significantly: x^2 (101, N = 9,779) = 589.32, $p < 0.001$; RMSEA = 0.022 (90% CI = [0.021, 0.024]; p (RMSEA < 0.05) = 1.00); CFI = 0.94; TLI = 0.93; SRMR = 0.076. All factor loadings were significant and moderate-to-high in size, except for Q10, which was at the threshold for acceptability (Fig. 1). When the HHCAHPS scores were correlated with the scores of the level of satisfaction, we found that participants with higher satisfaction for care scored also higher on the factors "communication with the providers" (r = 0.39, $p < 0.001$), "care of patients" (r = 0.34, $p < 0.001$), and "specific care issues" (r = 0.19, $p < 0.001$). Internal consistency yielded the following Omega coefficients:

Tab. I. Sociodemographic and clinic characteristics of the sample (N = 9,780).

	n (%) or mean (SD)
Sex	
Male	4,044 (57.57)
Female	5,585 (41.59)
Preferred not to reply	72 (0.74)
Age (years)	75.32 (14.61)
Education	
Primary school	3,671 (37.94)
Secondary school	4,888 (50.51)
Degree or post-degree	572 (5.91)
No formal education	546 (5.64)
Nationality	
Italian	9,373 (95.84)
Other	289 (2.96)
Perceived general health status	
Excellent	260 (2.69)
Good	2,379 (24.59)
Sufficient	3,772 (38.99)
Poor	1,947 (20.13)
Insufficient	1,316 (13.60)
Perceived mental/emotional status	
Excellent	718 (7.43)
Good	3,703 (38.31)
Sufficient	3,161 (32.71)
Poor	1,134 (11.73)
Insufficient	949 (9.82)
Living alone	
Yes	1,881 (19.43)
No	7,801 (80.57)
Need help filling out the survey	
Yes	5,391 (55.58)
No	4,308 (44.42)
Activation of home care	
On request made by the general practitioner	4,852 (49.83)
After discharge from the hospital	3,948 (40.54)
After discharge from a rehabilitation facility	323 (3.47)
After discharge from a private nursing home	202 (2.07)
After the request of the patient	64 (0.66)
After the request for social services	11 (0.11)
Other	338 (3.32)
Satisfaction with home care	
Very satisfied	2,747 (57.16)
Satisfied	1,575 (32.77)
Quite satisfied	347 (7.22)
Not very satisfied	35 (0.73)
Not at all satisfied	7 (0.15)
I'm still waiting for the problem to be resolved	95 (1.98)

"care of patients": ω = 0.62; "communication with the providers": ω = 0.60; "specific care issues": ω = 0.81.

Discussion

This study aimed to investigate the psychometric properties of the HHCAHPS in the context of the Italian home care services. Our results provide evidence of satisfactory validity and acceptable reliability of the scale in a large sample of individuals.

We found that the HHCAPS has satisfactory structural validity, with appreciable factor loadings. However, in our sample, item Q2 loaded onto the "specific care issues" factor, which is different from the authors' original postulation, where the item was conceptualized as an aspect of communication between the patient and provider. This may reflect a characteristic of the Italian population, who probably tend to give more importance to the information they receive instead of communication nuances when approaching the services for the first time because they want to prepare themselves as sufficiently as possible for future care needs. Notably, the right to be informed in Italy is emphasized both legally and ethically and is a constant evolving issue expanding also at a European level [21].

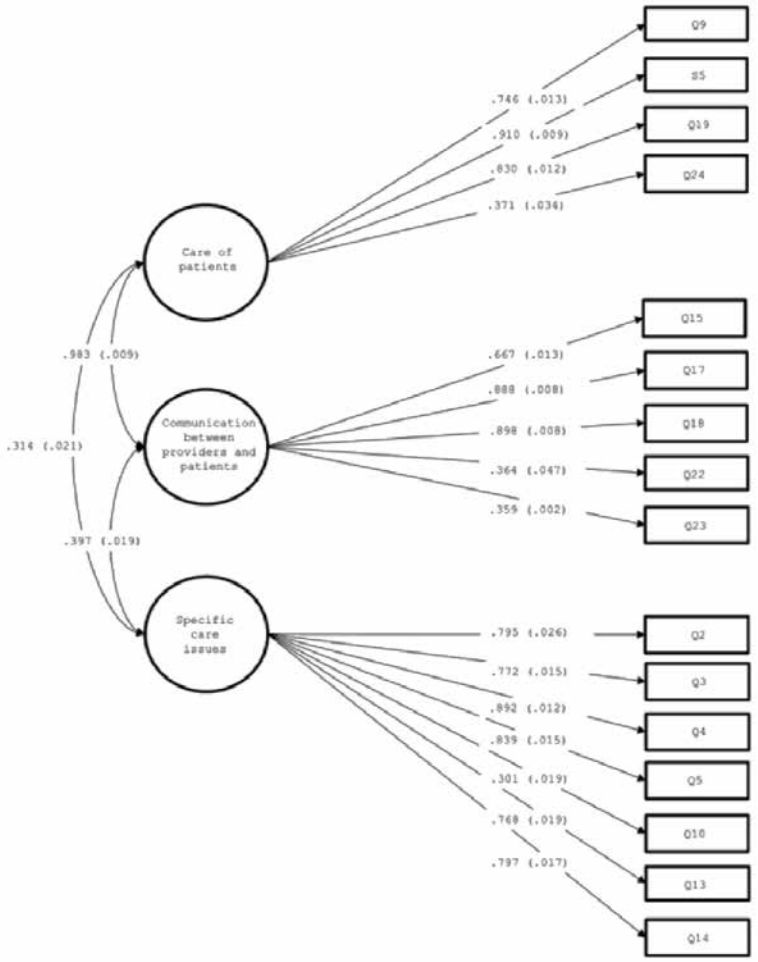
We also found evidence of acceptable internal consistency of the HHCAHPS. The traditional cut-off of 0.70 was not reached for the factors "care of patients" and "communication with the providers". This may be because there are some items loading weaker than the others to their respective factors. Specifically, item 24 loaded just over the threshold for adequacy in the "care of patients" factor, while items 22 and 23 showed the same issue in the communication factor. This may in turn be explained by the fact that such items have a high rate of missing (approximately half of our sample responded to these questions), and exhibit significant floor effects, because the patients mostly gave positive ratings. However, an internal consistency slightly below the threshold, as in our case, may not necessarily be a problem, since it has been discussed that reliability values as low as 0.50 should not seriously impact the validity of a scale [22]. As a result, we believe the scale is still reliable, although we recommend future testing in other populations.

Finally, we found that the HHCAHPS has satisfactory convergent validity given that the scores of the composite measures of "care of patients", "communication", and "specific care issues" were strongly correlated with the levels of satisfaction of the patients. This is not surprising, and reflects that patients mostly judge the quality of the communication with the healthcare provider and the actual care received in order to be

Tab. II. Descriptives of the items of the Home Health Care Consumer Assessment of Healthcare Providers and Systems (HHCAHPS).

Item		Response categories			
Care of Patients	**n**	**Always**	**Usually**	**Sometimes**	**Never**
Q9	8,249	6,851 (70.1)	1,438 (14.7)	309 (3.2)	53 (0.5)
S5	9,699	8,371 (85.6)	1,202 (12.3)	141 (1.4)	25 (0.3)
Q19	9,748	8,943 (91.4)	751 (7.7)	47 (0.5)	7 (0.1)
	n	Yes	No		
Q24	4,790	4,454 (45.5)	336 (3.4)	-	-
Communication between providers and patients	**n**	**Always**	**Usually**	**Sometimes**	**Never**
Q15	9,744	7,994 (81.7)	1,293 (13.2)	358 (3.7)	99 (1)
Q17	9,699	7,951 (81.3)	1,530 (15.6)	218 (2.2)	-
Q18	9,715	8,108 (82.9)	1,400 (14.3)	207 (2.1)	-
	n	Yes	No		
Q22	4,966	4,835 (49.4)	131 (1.3)	-	-
	n	Same day	1 to 5 days	6 to 14 days	More than 14 days
Q23	4,794	3,052 (31.2)	1,587 (16.2)	103 (1.1)	52 (0.5)
Specific care issues	**n**	**Yes**	**No**		
Q2	9,153	8,922 (91.2)	231 (2.4)	-	-
Q3	8,692	7,247 (74.1)	1,445 (14.8)	-	-
Q4	8,247	5,953 (60.9)	2,294 (23.5)	-	-
Q5	8,609	6,859 (70.1)	1,750 (17.9)	-	-
Q10	9,691	6,851 (70.1)	2,840 (29)	-	-
Q13	5,891	3,026 (30.9)	863 (8.8)	-	-
Q14	3,831	2,725 (27.9)	1,106 (11.3)	-	-
Global items	**n**	**0-5**	**6-10**		
Q20	9,728	73 (0.7)	9,655 (98.7)		
	n	**Definitely yes**	**Probably yes**	**Probably no**	**Definitely no**
Q25	9,673	7,715 (78.9)	1,853 (18.9)	61 (0.6)	44 (0.4)

Fig. 1. Confirmatory factor analysis of the Home Health Care Consumer Assessment of Healthcare Providers and Systems (HHCAHPS) scale.



Notes. Numbers near the one-headed arrows are standardized factor loadings. Numbers near the double-headed arrows are correlation coefficients. Standardized residuals are in brackets. Legend. Q, question.

satisfied with the services. In recent decades, there has been a significant expansion of literature focused on healthcare provider-patient communication as a key element of patient-centred care [23-25]. At the same time, there has been a tendency in modern healthcare to value patients' subjective experience of the care received [26]. This paradigm shift is important as it implies an increase in wellbeing and satisfaction, as well as better physical and mental health during the patient trajectory of care [27, 28].

Limitations and strengths of the study

This study has some limitations worth noticing. First, we enrolled a sample who were mostly satisfied with the home care received. Therefore, further psychometric testing of the HHCAHPS is needed for a more heterogeneous population. Second, the rate of missing was high for some items, which, in addition to the floor effects generally exhibited, led to a suboptimal reliability for some factors. Although we did not perform a missing data analysis, future studies should employ more effective ways of data collection to limit missing responses. Finally, this study presented an adapted version of the original scale determined following the specific aim of the AIDOMUS project. Thus, results should be confirmed for the original version of this scale.

This study also has noticeable strengths, including the large sample size, and its multicentric nature, which leads to confidently stating that the individuals enrolled accurately represent the real Italian population cared for by the LHA in their homes.

Conclusions

Overall, this study provides evidence that HHCAHPS is valid and sufficiently reliable when tested on the Italian population cared for by home healthcare services. Therefore, HHCAHPS could be a useful tool for promoting research and assisting healthcare providers develop interventions to promote patient-centred care

within home healthcare settings.

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Ethical approval

Approval for the study was obtained from the Ethics Committee (Liguria Region, n° 675/2022 – DB ID 12844, approved 29/11/2022).

Conflicts of interest statement

The Authors declare that there is no conflict of interest.

Authors' contribution (CRediT)

MDN, PI, IM writing – original draft; AB, RA, LL, DFM, LR, GR, MZ, GC, BM, LS: Conceptualisation, methodology, writing – review & editing; VC, FZ, YL, VV, DC, ABu, PL: writing – review & editing; MDN, PI: Data curation, formal analysis; AB, LS: Supervision.

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