



# Translation and Validation for the Portuguese Population of the Bedside Handover Attitudes and Behaviors Questionnaire

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**Purpose:** The Bedside Handover Attitudes and Behaviors questionnaire is a 32-item instrument originally developed in English that enables nurse managers to monitor the consistency of nurses' practice during the implementation of the Nursing Bedside Handover. We aimed to cross-culturally validate this questionnaire for the Portuguese population and to examine its psychometric properties.

**Methods:** An exploratory-descriptive, quantitative, cross-sectional, and validation study was conducted. A sample of 241 nurses from a Portuguese acute care hospital participated in the field test. The questionnaire was cross-culturally adapted through translation, translation synthesis, and back-translation procedures, an expert committee harmonization, and two pre-tests.

**Results:** We obtained one factorial solution through exploratory factor analysis that explained 53.5% of the total variance, with 18 items distributed by four components: Direct Engagement, Personal Interaction, Information Sharing, and Individualized Approach. Confirmatory factor analysis supported the four-factor factorial structure of the questionnaire  $X^2/df = 1.440$ ; CFI = 0.0953; GFI = 0.926; RMSEA = 0.043;  $P[\text{rmsea}] < 0.001$ ; MECVI = 1.175). *Cronbach's*  $\alpha$  indicated acceptable reliability for the total questionnaire ( $\alpha = 0.790$ ). The refinement of the instrument led to the proposal of a new Conceptual Model for Patient Participation in Nursing Bedside Handover.

**Conclusion:** The questionnaire is valid and reliable for use by Portuguese nurse managers. This adapted version of the BHAB questionnaire can be applied by nurse managers to facilitate the implementation of Nursing Bedside Handover.

**Keywords:** patient handoff, patient participation, patient-centered care, patient safety, validation studies, nursing administration research

## Introduction

Since the beginning of the century, the report "To Err is human: Building a Safer Health System",<sup>1</sup> has drawn the attention of nurses to the high number of adverse events experienced by patients due to communication breakdowns among health professionals. In 2017, the Joint Commission released the Sentinel Event Alert, stating that

potential for patient harm - minor to serious harm - is introduced when the receiver receives information that is inaccurate, incomplete, not timely, misinterpreted, or otherwise not what is needed.<sup>2</sup>

In 2024, the Joint Commission International continues to challenge healthcare organizations to improve the effectiveness of active communication as one of the Patient Safety Goals.<sup>3</sup> More than two decades later, nurses continue to implement innovative solutions to improve the effectiveness of communication and mitigate the occurrence of adverse events due to communication problems.<sup>4</sup>

Communication problems among healthcare professionals are noted as one of the main reasons for preventable adverse events in hospital institutions.<sup>5-7</sup> In these institutions, nurses transmit patient information to each other two or



three times a day, often with different nurses on each shift.<sup>8</sup> In addition, the performance of the shift handover “away from the patients”,<sup>9,10</sup> has been associated with risks to Patient Safety and Continuity of Care.<sup>11–13</sup> To enhance communication safety, diverse studies and experiences on transitioning to Nursing Bedside Handover (NBH) have been reported over the last decade.<sup>14–22</sup> This type of shift handover, often described as a real-time shift handover, does not involve the entire team of nurses. It involves only the nurse finishing the shift and the nurse starting it.<sup>19,21–27</sup> It takes place at patient’s bedside in their rooms, or elsewhere in the ward, with sensitive information potentially being shared “away from the patient” to maintain confidentiality.<sup>25,27–33</sup> It can involve patients in the handover and family members, according to their preferences.<sup>25,26,28–30,34–36</sup> Therefore, it is recognized as a patient-centered approach,<sup>22,37</sup> and an interpersonal process in nature.<sup>38</sup> Goodridge et al<sup>39</sup> classified NBH as an intervention that promotes patients’ active participation in the delivery of nursing care. To improve the quality of nurses’ handover, Chiappinotto et al<sup>40</sup> recommended the development of interventions within a complex intervention framework, for which nurses need valid and reliable measurement and evaluation instruments.

Patient Participation is considered one of the pillars of Patient-Centered Care.<sup>41–43</sup> Tobiano et al<sup>44</sup> defined Patient Participation as a dyadic interaction between the patient and the nurses, which empowers patients to passively or actively take part in the communication activities or nursing care they need. Promoting Patient Participation during NBH is based on the assumption that patients’ contributions about their care and its evolution can influence Patient Safety.<sup>45</sup> In a conceptual analysis conducted by Kvæl et al,<sup>46</sup> nurse–patient interaction, information sharing and patient engagement were identified as essential features of this concept. Similarly, in a study conducted by Dahm et al,<sup>47</sup> these three characteristics were recognized during NBH by nurses who were starting their shift. In addition, the report of high levels of individualized nursing care from a sample of 90 patients in an oncology unit after two years of NBH implementation also indicates an individualized approach by nurses during shift handover.<sup>48</sup>

A study conducted by Oxelmark et al,<sup>49</sup> involving 1308 patients, found that patients prefer to be active partners during the NBH, listening, asking questions, and being able to speak when they want or need to. However, conducting NBH with the patient does not mean that nurses can always achieve their active participation.<sup>50</sup> Some patients lack the capacity to participate or prefer to take a passive role during NBH.<sup>51,52</sup> Nurses may also resist to promote Patient Participation.<sup>53–55</sup> or adopt adaptive practices to address patients’ and families’ personal and environmental factors,<sup>56</sup> especially concerning the confidentiality and sensitivity of information,<sup>45</sup> and the needs of incoming nurses.<sup>57</sup> According to Tobiano et al,<sup>45</sup> when nurses’ practice does not promote patient engagement, nurse–patient interaction, or respect for patients with appropriate information, NBH tends to be more Nurse Centeredness rather than Patient Centeredness. To successfully engage patients in NBH, nurses need to have: 1) characteristics and abilities to build rapport with patients; 2) ability to individualize care and 3) ability to integrate biopsychosocial perspectives.<sup>58</sup>

The uses of the NBH concept in scientific literature suggest attributes related not only to information but also to interaction, engagement, and individualization. Information attributes are supported by uses of the NBH in relation to the structured transmission of information,<sup>59–61</sup> transmission of accurate and complete information,<sup>24,62</sup> access to nursing documentation,<sup>63,64</sup> monitoring patient progress,<sup>65,66</sup> monitoring the environment and equipment,<sup>64,65</sup> and prioritization of care for the next shift.<sup>17,67</sup> The interaction attributes comprise the presentation of nurses who receive the shift,<sup>25,48</sup> the use of non-verbal communication,<sup>68,69</sup> and the building of a nurse–patient relationship.<sup>14,45</sup> Engagement attributes are reflected in uses of the concept involving calls for patients to express opinions and comments,<sup>19,48</sup> asking questions,<sup>19,60</sup> planning care with patients and families,<sup>14,62,70</sup> and discussing the nursing plan with patients and families.<sup>48,65</sup> Lastly, individualization attributes are supported by the concept’s application to patients’ preferences to participate or not,<sup>45,48</sup> while maintaining the confidentiality of information.<sup>30</sup>

Although in some cultures the implementation of NBH may be mandatory,<sup>71</sup> this practice has a variable nature,<sup>72</sup> and can be influenced by a variety of nurses’ attitudes and behaviors, namely: a) nurses’ concerns about confidentiality and privacy issues;<sup>73</sup> b) difficulty delimiting communication spaces according to the sensitivity of patient information,<sup>48,74</sup> c) nurses’ low personal confidence in communicating;<sup>48,74</sup> d) fear of misinterpretations by patients and family;<sup>73</sup> e) inexperience in dealing with criticism from patients and nurses;<sup>26</sup> f) difficulty in controlling environmental interferences,<sup>29,74</sup> and in managing communication during nursing handover;<sup>24,74</sup> g) nurses’ concerns with time management;<sup>48,75</sup> h) differences of opinion among nurses;<sup>24,29</sup> i) divergence in nurses’ motivations;<sup>48</sup> j) waiting times

among nurses;<sup>16,73</sup> k) imbalances in team organization due to non-coinciding work schedules;<sup>76</sup> l) need for electronic records consultation;<sup>24,73</sup> m) need to be informed about all patients;<sup>16</sup> and n) methods for passing information between nurses.<sup>24</sup>

The concern with Patient-Centeredness during this modality of handover, as opposed to the simple handover next to the patient, has led some authors to distinguish the Patient-Centered Handover from a model called Person-Centered Handover.<sup>61</sup> This model emphasizes the need for a change in nurses' attitudes and behaviors, and aims to promote Patient Participation during the shift handover,<sup>61</sup> as a result of a person-centered communication.<sup>26</sup> In Portugal, Cruchinho<sup>77</sup> adopted the concept of Client-Centered Shift Handover ("Passagem de Turno Centrada no Cliente") in the translation of NBH to highlight the importance of nurses' communication skills in promoting the active participation of those who are the beneficiaries of nursing care within the therapeutic relationship context. Despite the scarcity of empirical research on Patient Centeredness during NBH,<sup>26,78</sup> a scoping review conducted by Bressan et al<sup>79</sup> revealed that studies related to NBH have made little use of nursing conceptual frameworks or patient-centered frameworks. Tobiano et al,<sup>80</sup> developed a patient-centered framework consisting of the following constructs: 1) conditions for patient participation in bedside handover; 2) level of patient participation in bedside handover and 3) evaluation of patient participation in bedside handover. However, since the work of Kullberg et al,<sup>26,61</sup> on Person-Centered Handover, the knowledge gap in nurses' conceptualization of patient engagement during NBH,<sup>81</sup> remains actual.

## Rationale and Aim of the Study

The importance of nurse managers in organizational change processes for NBH was highlighted by Malfait et al,<sup>18</sup> who recommended greater attention on achieving more patient-centered nursing care rather than on the change itself. Increasing Patient Centeredness in nursing practices requires nurse managers to create a supportive environment characterized by periodic supervision and monitoring.<sup>69</sup> The use of measurement instruments in healthcare organizations enables the identification of trends and, consequently, the adjustment of strategies to implement change accordingly.<sup>82,83</sup> To understand the attitudes and practices of Australian nurses, Slade et al,<sup>71</sup> developed the Bedside Handover, Attitudes and Behaviors (BHAB) questionnaire. To date, no cross-cultural validation studies of the BHAB questionnaire have been conducted. In Portugal, no studies have developed instruments to assess nurses' attitudes and practices regarding the NBH. Consequently, we formulated the following research question: What are the psychometric properties of the BHAB questionnaire translated and adapted for the Portuguese cultural context? This study aimed to cross-culturally validate the BHAB questionnaire for the Portuguese population and to analyze the quality of its psychometric properties. Portuguese nurse managers need a cross-culturally validated version of the questionnaire to redesign NBH processes and evaluate changes in nurses' attitudes and behaviors. As stated by Kullberg et al,<sup>26</sup> changing nurses' attitudes is a necessary requirement for adopting person-centered communication during NBH.

## Materials and Methods

### Study Design

We conducted a cross-cultural validation study with a quantitative approach and an exploratory-descriptive, cross-sectional research design. Once it intends to validate the instrument's ability to produce significant results, it is classified as a validation study.<sup>84</sup> In the area of Health Services Research, such studies are common.<sup>85</sup>

### Ethical Considerations

We obtained permission to translate and cross-culturally validate the BHAB from the authors and from the John Wiley & Sons, which holds the copyright to the article by Slade et al<sup>71</sup> published in the Journal of Nursing Management. This study was approved by the Ethics Committee for Health of Hospital de Cascais Dr José de Almeida (approval number 5/CE 31/03/2021) and was conducted in accordance with the declaration of Helsinki.<sup>86</sup> All participants provided written and voluntary consent to participate. During this validation study, all ethical principles were followed.<sup>87,88</sup>

## Questionnaire Description

The BHAB questionnaire was developed in Australia to understand nurses' attitudes and behaviors towards the NBH with three sections and a total of 32 items.<sup>71</sup> The first section analyzes whether nurses agree or disagree with a set of characteristics of NBH. These characteristics are distributed over 18 items, each corresponding to a particular nurse attitude. The second section seeks to determine whether nurses consider themselves capable of performing certain actions during NBH. It comprises 14 items, each directed at a specific action. Both sections include 14 items assessing the same characteristics of NBH and four items assessing attitudes only. All items use a single six-point Likert-type response format (1. "strongly disagree" to 6. "strongly agree"), without a neutral point but including an additional "not applicable" option. The third section includes nurses' socio-demographic data. The internal consistency measures reported by the authors (a *Cronbach's*  $\alpha$  of 0.98 and an interclass correlation coefficient of 0.97),<sup>71</sup> supported the decision to translate and culturally adapt the BHAB questionnaire for the Portuguese population. The dimensions of a measurement instrument are observable components or indicators of the concept of interest, the selection of which is guided by your theoretical definition or map of the concept's meaning.<sup>89</sup> The BHAB questionnaire is an instrument in which the dimensionality is not known. Factor analysis is an essential tool in the development of measurement instruments to determine the number of factors underlying a set of items.<sup>90</sup>

## Cross-Cultural Translation and Adaptation Processes

To achieve conceptual, semantic, and content equivalence in the translation and cross-cultural adaptation of the BHAB questionnaire, we followed the guidelines of Sousa and Rojjanasrirat.<sup>91</sup> The translation process involved two certified bilingual translators, both native Portuguese speakers – one familiar with the concept of NBH and the other not. Each translator independently translated the BHAB questionnaire into Portuguese and produced a translation report with comments on any doubts and the rationale for their translations. A third certified bilingual translator, also with Portuguese as a mother tongue, synthesized the two Portuguese translations based on the discrepancies and ambiguities found between the two translations and the original version of the BHAB questionnaire. This synthesis was then reviewed and consensualized through a Committee Approach. Subsequently, the consensualized Portuguese version was back-translated into English by two certified bilingual translators, both native English speakers. These translators independently produced two back-translations without contacting the original version of the BHAB questionnaire. They also drafted a back-translation report noting their doubts and decisions. None of these translators were familiar with the concept of NBH. Next, a linguistic expert in both Portuguese and English retrospectively reviewed all translations and identified ambiguities and discrepancies between the back-translations, the Portuguese translations, and the original questionnaire. Two conceptual ambiguities were clarified via Email by one of the original instrument's authors. Afterwards, all ambiguities and discrepancies were presented by the linguistic expert in a Multiprofessional Committee, which included all translators participating in the translation and back-translation stages. A Portuguese monolingual nurse from the hospital organization hosting the study, and a member of the research team, moderated the discussion and took notes on the decisions made. At the end of this meeting, an adapted version of the measurement instrument, which was identified as BHAB-PT questionnaire, was obtained.

Finally, before testing the adapted version of the questionnaire, we conducted two pre-tests. In the first pre-test, a set of 27 nurses from the units and services participating in the study were asked to assess the clarity of the instruments' items. Due to the number of nurses, the questionnaire was delivered electronically. In this questionnaire, the nurses rated each item with a dichotomous scale ("is clear" and "is not clear"). For items marked as "unclear", nurses were asked to write a new wording that would solve the lack of clarity. Rewording proposals for items a3, a4, a5, a10, a12, a13, 15, a16, a18, c2, and c4 were reported in a previous study by the authors.<sup>92</sup> All items were then analyzed by two nurses from the target population, who decided to retain the previous wordings. In the second pre-test, an Expert Panel of nine nurse managers from the participating units assessed the relevance of each item using a 4-point Likert-type scale (1. "not at all relevant" to 4. "highly relevant"). The translation and cross-cultural adaptation processes of BHAB into Portuguese were reported in detail in a study evaluating the methodological approaches used.<sup>92</sup> The evaluation of the methodological

approaches used to translate, adapt and validate this measurement instrument resulted in the development of a proposal for a practical guideline for novice researchers.<sup>93</sup>

## Sample and Setting

Data were collected between June 2021 and January 2022 at a Portuguese hospital in the Lisbon region accredited by the Joint Commission International. This hospital has one of the International Patient Safety Goals: the development and implementation of a process to improve clinical handover.<sup>94</sup> The target population included 342 nurses from the units and services where NBH had been implemented for at least four years. Participants were recruited by a non-probability convenience sampling method by a collaborating nurse, in conjunction with the nurse managers of the involved units. This nurse recruited participants from the pediatric, medical, surgical, and obstetrics inpatient units, as well as neonatology and intensive care units, general and pediatric emergency departments, and delivery and operating room blocks. For this purpose, the nurse collaborator shared a link to the pre-final version of the BHAB-PT questionnaire with the nurse managers, who then disseminated it to their teams. The sample size was determined based on the criterion of 5 to 10 participants per item for factor analysis.<sup>95</sup>

## Data Analysis

An Exploratory Factor Analysis (EFA) of the questionnaire was performed for two reasons: 1) its dimensionality was unknown and 2) to analyze the Construct Validity in the Portuguese population. The adequacy of the EFA was analyzed based on the Kaiser–Meyer–Olkin (KMO) Test ( $KMO > 0.7$ ),<sup>96</sup> and Bartlett's Test of Sphericity ( $p < 0.001$ ).<sup>97</sup> The decision on the number of factors to retain was based on the criterion of eigenvalue  $>1$ ,<sup>98</sup> and *Cronbach's  $\alpha$* .<sup>99</sup> The interpretation of *Cronbach's  $\alpha$*  was based on the following scale: a)  $\alpha < 0.60$  (weak value); b)  $0.60 \leq \alpha < 0.70$  (questionable value); c)  $0.70 \leq \alpha < 0.80$  (acceptable value); d)  $0.80 \leq \alpha < 0.90$  (good value); and e)  $\geq 0.90$  (excellent value).<sup>100</sup> For factor extraction, we used the Varimax method to maximize the variance within factors.<sup>98</sup> For the EFA, we followed four decision criteria: 1) the saturation coefficient or factor loading with a cut-off point  $>0.40$ ;<sup>101,102</sup> 2) selecting the factor with the highest factorial weight; 3) excluding items with communalities  $<0.30$ ,<sup>103,104</sup> and 4) the percentage of variance of the explanatory model between 50% and 60% for the Social Sciences.<sup>105</sup> This is consistent with the researcher's ontological assumption that nursing practice is a social practice, contextualized not only in individual situations of patients and nurses but also in the ongoing structure of practice situations, in which nurses influence and are influenced by each other's practice.<sup>106</sup> To obtain the factor structure of the BHAB-PT questionnaire, we used the IBM SPSS software® Statistics (Version 27.0).<sup>107</sup> The interpretation of the model that fitted the sample data was based on a literature review. To name the factors, we used an abductive reasoning between the items that integrate them and the reviewed literature. This type of reasoning uses analogy to build theoretical explanations of reality.<sup>108</sup>

To analyze the feasibility of the factor structure of the BHAB-PT questionnaire obtained in the EFA, we conducted a Confirmatory Factor Analysis (CFA),<sup>109,110</sup> using the IBM SPSS software® Amos (Version 27.0).<sup>111</sup> In assessing the composite reliability and the mean variance extracted from each factor, we followed the guidelines of Fornell and Larcker.<sup>112</sup> The quality of the global adjustment of the factorial model was assessed using the following reference values: 1) Chi-square test ( $X^2/df$ : the smallest possible value); 2) Comparative Fit Index (CFI) where values  $\geq 0.90$  and  $\geq 0.95$  indicate a good and very good fit, respectively), 3) Goodness-of-Fit Index (GFI) with the same reference values as in the previous item; 4) Root Mean Square Error of Approximation (RMSEA)  $> 0.10$ ; 5) Significance level of RMSEA,  $P[rmsea] \leq 0.005$ ; and 6) Modified Expected Cross-Validation Index (MECVI): the lowest possible value.<sup>113</sup> The model adjustment was made based on the modification indices (greater than 11;  $p < 0.001$ ) produced by IBM SPSS software® Amos and theoretical considerations.<sup>113</sup> For each dimension of the BHAB-PT questionnaire to have an interpretation based on the measured construct and for the total questionnaire to have an interpretation related to the main construct, we defined a range of values resulting from the sum of the respective scores for each of the four dimensions and for the total questionnaire.<sup>114,115</sup> The use of Summed Scales and Summed Subscales is recommended to promote the generalization and replication of the psychometric properties of measurement instruments.<sup>116</sup>

To evaluate internal consistency, best practices recommend that researchers compute both *Cronbach's  $\alpha$*  and the mean inter-items correlations.<sup>117</sup> The internal consistency of the BHAB-PT questionnaire was analyzed from the values of: 1)

*Cronbach's  $\alpha$* ; 2) Mean Inter-item Correlation; and 3) Amplitude of the Item-total Correlations. These values were obtained through the IBM SPSS® Statistics.<sup>107</sup> In measurement instruments that are being refined and tested with multiple samples, a *Cronbach's  $\alpha$*  of 0.80 is considered strong.<sup>118</sup> To analyze the Mean Inter-item Correlations, we adopted reference values between 0.15 and 0.50 for comprehensive constructs.<sup>119</sup> For the analysis of Item-total Correlation values, we used reference values >0.30 as indicators of good correlation indices.<sup>120</sup>

## Results

The sample consisted of 241 nurses, corresponding to a response rate of 70% and a ratio of 7.5 participants per item. Most participants were women (n = 205, 85.1%) and aged less than 31 years (n = 161, 66.8%). More than half of the participants had worked in the hospital for less than four years (n = 166, 68.9%) and had worked as nurses for less than 4 years (n = 137, 57.4%). Less than one-third of the total sample held a postgraduate or master's degree (n = 60, 24.9%). Most participants reported having no experience of peer supervision (n = 130, 53.9%) and almost all worked full time (n = 235, 97.5%). Finally, approximately half of the participants worked in emergency departments, intensive care units, labor and delivery units, or operating rooms (n = 103, 42.7%). Table 1 shows the sociodemographic data of the study sample.

**Table 1** Sociodemographic Data of the Study Sample (n = 241)

	n (%)
<b>Age</b>	
≤ 25 years	111 (46,1)
26–30 years	50 (20,7)
31–35 years	29 (12,0)
36–40 years	22 (9,1)
41–45 years	13 (5,4)
46–50 years	6 (2,5)
≥51–55 years	8 (3,3)
No response	2(0,9)
<b>Professional experience in the hospital</b>	
≤ 1 year	71 (29,5)
2–3 years	95 (39,4)
4–5 years	26 (10,7)
6–10 years	20 (8,3)
11–15 years	21 (8,7)
16–20 years	4 (1,7)
≥ 20 years	4 (1,7)
<b>Professional experience as a nurse</b>	
≤ 1 year	52 (21,6)
2–3 years	85 (35,3)
4–5 years	18 (7,4)
6–10 years	28 (11,6)
11–15 years	26 (10,8)
16–20 years	18 (7,5)
≥ 20 years	14 (5,8)
<b>Gender</b>	
Male	36 (14,9)
Female	205 (85,1)
<b>Highest academic qualification</b>	
Bachelor's degree	181 (75,1)
Postgraduate diploma	32 (13,3)
Master's degree	28 (11,6)

(Continued)

**Table 1** (Continued).

	n (%)
<b>Working-time regime</b>	
Part time	6 (2,5)
Full time	235 (97,5)
<b>Supervision of nurses</b>	
No	130 (53,9)
Yes	111 (46,1)
<b>Clinical ward</b>	
Pediatrics inpatient ward	8 (3,3)
Medicine inpatient ward	57 (23,6)
Neonatal intensive care ward	11 (4,6)
Intensive care ward	10 (4,1)
Surgery inpatient ward	45 (18,7)
General emergency ward	54 (22,4)
Inpatient obstetric ward,	12 (5,0)
Pediatric emergency ward	12 (5,0)
Delivery Room	9 (3,7)
Operating room	7 (2,9)
No response	16(6,7)

## Exploratory Factor Analysis

We obtained a final model consisting of four components with 18 items, which explained 53.6% of the total variance (Table 2). Factor 1 was designated Direct Engagement because it included the following items: a.3 “Os enfermeiros devem permitir que o cliente ouça e veja com facilidade a passagem de turno” (Nurses should allow the patient to easily hear and see the handover), a.4 “Não há necessidade de envolver os clientes na discussão da passagem de turno” (There is no need to involve patients in the discussion), c.2 “Coloco-me numa posição que permita facilmente ao cliente ouvir, ver e contribuir para a passagem de turno” (I stand in a position that allows the patient to easily hear, see, and contribute to the handover), and c.3 “Peço aos clientes que contribuam, esclareçam e confirmem a informação acerca da sua situação clínica” (I ask patients for input, clarification, and confirmation on their medical information). This construct was defined as the extent to which nurses encourage patients’ active participation in the handover.

Factor 2 was named as Personal Interaction since it comprises the items a.1 “Os enfermeiros devem apresentar-se e tratar os clientes pelo nome” (Nurses should introduce themselves personally and greet patients by name), a.2 “É necessário que os enfermeiros estabeleçam contacto visual com o cliente” (Nurses need to make eye contact with the patient), a.8 “É necessário que os enfermeiros escutem os clientes” (Nurses need to listen to patients), a.9 “É necessário que os enfermeiros respondam às questões e comentários dos clientes” (Nurses need to react to patients’ comments and questions), and a.10 “Não há necessidade de os enfermeiros usarem a comunicação não verbal (por exemplo, contacto visual, toque ou aceno de cabeça) com o cliente” (There is no need for nurses to use nonverbal cues (for example, eye contact, touch, or nodding) with the patient). This factor was defined as the degree to which nurses build a trusting relationship with patients during handover.

Factor 3 was named Information Sharing as it included the items: a.15 “Os enfermeiros que estão de saída de turno devem iniciar a passagem de turno identificando o cliente, o seu médico e a razão pela qual está no hospital” (Outgoing nurses should begin the handover by identifying the patient, his/her clinician and the reason why the patient is in hospital), a.16 “É necessário que os enfermeiros que estão de saída de turno expliquem o estado clínico atual do cliente” (Outgoing nurses need to explain the patient’s presenting condition), c.11 “Como enfermeiro que está de saída, inicio a passagem de turno identificando o cliente, o seu médico e a razão pela qual está no hospital” (As an outgoing nurse, I begin the handover by identifying the patient, his/her clinician, and the reason why the patient is in hospital), and c.12 “Como enfermeiro que está de saída de turno, explico a evolução e o estado clínico atual do cliente” (As an outgoing

**Table 2** Factor Analysis of the Items of the BHAB-PT Questionnaire

Items	Components <sup>a</sup>				Communalities
	Direct Engagement	Personal Interaction	Information Sharing	Individualized Approach	
a.3	0.83	–	–	–	0.705
a.4	0.79	–	–	–	0.663
c.2	0.79	–	–	–	0.691
c.3	0.74	–	–	–	0.60
a.1	–	0.60	–	–	0.38
a.2	–	0.70	–	–	0.55
a.8	–	0.75	–	–	0.59
a.9	–	0.42	–	–	0.33
a.10	–	0.70	–	–	0.50
a.15	–	–	0.83	–	0.72
a.16	–	–	0.55	–	0.31
c.11	–	–	0.87	–	0.79
c.12	–	–	0.53	–	0.42
a.14	–	–	–	0.73	0.57
c.6	–	–	–	0.50	0.28
c.7	–	–	–	0.42	0.48
c.9	–	–	–	0.55	0.40
c.10	–	–	–	0.78	0.66

**Notes:** **a.3:** Nurses should allow the patient to easily hear and see the handover; **a.4:** There is no need to involve patients in the discussion; **c.2:** I stand in a position that allows the patient to easily hear, see and contribute to the handover; **c.3:** I ask patients for input, clarification and confirmation on their medical information; **a.1:** Nurses should introduce themselves personally and greet patients by name; **a.2:** Nurses need to make eye contact with the patient; **a.8:** Nurses need to react to patients' comments and questions; **a.9:** Nurses need to react to patients' comments and questions; **a.10:** There is no need for nurses to use nonverbal cues (for example, eye contact, touch or nodding) with the patient; **a.15:** Outgoing nurses should begin the handover by identifying the patient, his/her clinician and the reason why the patient is in hospital; **a.16:** Outgoing nurses need to explain the patient's presenting condition; **c.11:** As an outgoing nurse, I begin the handover by identifying the patient, his/her clinician and the reason why the patient is in hospital; **c.12:** As an outgoing nurse, I explain the presenting condition and how the patient has been doing on my shift; **a.14:** Nurses should be sensitive to cross-generational and cultural differences in the discussion; **c.6:** I refer to patients only saying "he/she/they" or descriptor terms, like "40-year-old male"; **c.7:** I listen to patients and react to their comments and questions; **c.9:** I write down patient concerns in the notes; **c.10:** I am sensitive to cross-generational and cultural differences in the discussion. <sup>a</sup>Loadings > 0.40.

nurse, I explain the presenting condition and how the patient has been doing on my shift). This construct was defined as the degree to which nurses maintain patient safety during the handover.

Finally, factor 4 comprised five items: a.14 "Os enfermeiros devem ser sensíveis às diferenças inter-geracionais e culturais na discussão da passagem de turno" (Nurses should be sensitive to cross-generational and cultural differences in the discussion), c.6 Refiro-me aos clientes, apenas, como "ele/ela" ou, por termos descritivos "homem de 40 anos" (I refer to patients only saying "he/she/they" or descriptor terms like "40-year-old male", c.7 "Escuto os clientes e respondo aos seus comentários e questões" (I listen to patients and react to their comments and questions), c.9 "Anoto as preocupações dos clientes nos registos de enfermagem" (I write down patient concerns in the notes), and c.10 "Sou sensível às diferenças inter-geracionais e culturais na discussão da passagem de turno" (I am sensitive to cross-generational and cultural differences in the discussion). This factor was referred to as Individualized Approach and defined as the degree to which nurses attend to patients' individual needs and preferences during handover.

## Internal Reliability Analysis

Regarding the overall instrument, a *Cronbach's*  $\alpha$  of 0.79 was obtained, which is considered close to strong for a recently developed instrument.<sup>120,121</sup> However, this coefficient was lower than that reported by the original authors ( $\alpha=0.98$ ).<sup>71</sup> Since we obtained *Cronbach's*  $\alpha$  values below 0.70 for the Personal Interaction, Information Sharing, and Individualized Approach factors, Pallant's recommendation was followed to determine and report the average inter-item correlation value. We obtained acceptable coefficients of Mean Inter-Item Correlation and Total Item Correlation were obtained for each of the questionnaire's factors (Table 3).

**Table 3** Internal Consistency Coefficients of the Factors Obtained for the BHAB-PT Questionnaire

	$\alpha$ of Cronbach	Mean Inter-Item Correlations	Correlation Amplitude Item Total
<b>Direct Engagement</b>	0.82	0.53	0.60–0.69
<b>Personal Interaction</b>	0.69	0.30	0.31–0.53
<b>Information Sharing</b>	0.68	0.35	0.34–0.73
<b>Individualized Approach</b>	0.65	0.27	0.36–0.57
Total Instrument	0.79	–	–

Note: n=241.

## Confirmatory Factor Analysis

Initially, the resulting tetra-factor model in the sample of Portuguese nurses ( $n = 241$ ) revealed a poor quality of adjustment ( $X^2/df = 2.336$ ; CFI = 0.848; GFI = 0.883; RMSEA = 0.075;  $P[\text{rmsea}] < 0.001$ ; MECVI = 1.636). At a later stage, after correlating the assessment errors of items a.3 and a.4 in the factor or dimension Direct Engagement, items a.2, a.8, a.9 and a.10 in the dimension Personal Interaction, items a.16 and c.12 in the dimension Information Sharing and items a.14, c.06, c.9 and c.10 in the dimension Individualized Approach, it was possible to obtain a good quality of adjustment, supporting the factorial validity of the BHAB-PT questionnaire. In a second moment, the simplified model showed a higher quality of adjustment than the original model in the study sample ( $X^2/df = 1.440$ ; CFI = 0.953; GFI = 0.926; RMSEA = 0.043;  $P[\text{rmsea}] < 0.001$ ; MECVI = 1.175), with an  $X^2(122) = 1.440$  fit ( $p = 0.001$ ), as well as a considerably lower MECVI (1.636 vs 1.175) (Figure 1).

## Discussion

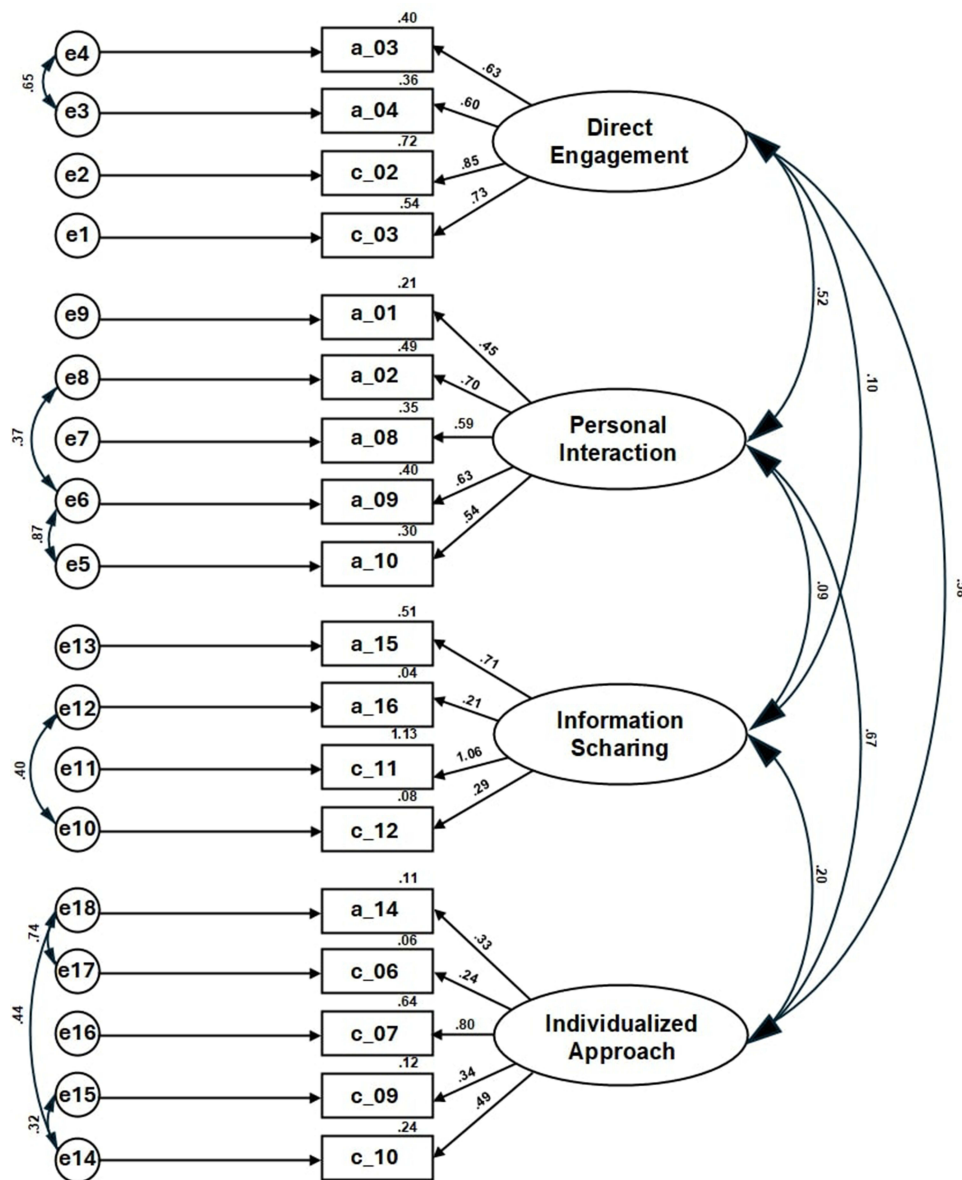
This study aimed to translate the BHAB questionnaire into Portuguese, adapt it to the Portuguese population, and analyze its psychometric properties. Next, we will discuss the results concerning the dimensions, psychometric properties, and refinement of the BHAB-PT questionnaire.

### Dimensions of the BHAB-PT Questionnaire

The final version of the questionnaire comprises 18 items represented by four dimensions or components: 1) Individualized Approach; 2) Personal Interaction; 3) Information Sharing and 4) Direct Engagement. These dimensions suggest that NBH constitutes a nursing practice that allows promoting Patient Participation during hospitalization.<sup>39</sup>

The nurses' Individualized Approach during NBH as a dimension that promotes Patient Participation, is in line with the results of previous studies. Bårdsgjerde et al,<sup>122</sup> in a study exploring the perception of 22 nurses on Patient Participation in a hemodynamic unit, identified the individualization of dialogue with patients as a way for nurses to express their concern to respect and adjust the level of information shared according to patients' needs. Oxelmark et al,<sup>123</sup> in a study also investigating the experiences of 20 nurses on Patient Participation in medical units, identified the partnership between nurses and patients as an important element for Patient Participation, demonstrated through the nurses' willingness to listen to patients. According to Ekman et al,<sup>124</sup> patient narrative constitutes a requirement for establishing a partnership between nurses and patients. When nurses tailor nursing care processes and practices to patients' individual preferences, condition, and needs, this translates into individualized nurses' performance.<sup>125,126</sup>

The contribution of the Personal Interaction dimension to the promotion of Patient Participation is supported by some previous authors. For example, Miller et al,<sup>127</sup> in a Focus Group study exploring the experiences and perceptions of nurses in a post-anesthesia unit regarding Patient Participation, identified ensuring a trusting relationship and the nurse–patient relationship as elements of Patient Participation. According to Morgan,<sup>43</sup> patient trust promotes patient self-determination and this facilitates patient participation in decision making about their own care. Additionally, Kuosmanen et al<sup>128</sup> considered the bond between nurses and patients as an essential requirement of Patient Participation in a study



**Figure 1** Final confirmatory factor analysis model for the BHAB-PT questionnaire.

synthesizing research findings on patient participation in decision making in palliative care. During NBH, the link between nurses and patients is developed by nurses mostly through the non-verbal communication.<sup>50</sup> Diverse forms of non-verbal communication, such as eye contact, smiling, and touch from professionals, allow patients to perceive understanding and empathy from nurses.<sup>129</sup> Dahm et al<sup>47</sup> found that nurses starting their shift control more interpersonal connections are more approachable and encourage participation during NBH more than nurses finishing their shift. In a qualitative study based on the perceptions of 119 patients and 20 relatives, the introduction of the nurses starting their shift was considered a very reassuring activity.<sup>130</sup> In a qualitative study conducted by Sahlsten et al,<sup>131</sup> building trust in patients was a strategy reported by nurses to encourage Patient Participation. Patients' trust in nurses incoming<sup>10,22,51,132</sup> supports Personal Interaction during NBH.

The dimension Information Sharing is also supported in literature as a way of contributing to Patient Participation. According to Oxelmark et al,<sup>123</sup> the progressive information sharing of nurses with patients regarding care planning has been associated with an opportunity for patient empowerment for participation in care. Similarly, Eggins and Slade<sup>133</sup> reported the joint verification of information during NBH between nurses and patients. In addition, Information Sharing

with patients is an element of NBH that generates a perception of patient safety, when patients perceive that the information received by nurses allows them to be aware of what is expected to happen during the next shift.<sup>130,134</sup> In a study by Street et al,<sup>135</sup> patients justified the importance of Information Sharing due to the value of information about their treatment and discharge plan, while nurses highlighted the relevance of Information Sharing during NBH as an opportunity to clarify information regarding nursing care. According to Forde et al,<sup>50</sup> this possibility of patients to clarify information constitutes an opportunity for Patient Participation in reducing risk during the hospital stay. Slade et al<sup>136</sup> demonstrated that the greater the relationship between Information Sharing between nurses and patients, the greater the ability of nurses to establish interactions with patients as a result of specific training. Information Sharing during NBH is also supported by Manges and Groves' finding,<sup>67</sup> of a latent function of NBH, as an intersubjective process, which requires a shared understanding between nurses and patients. This process can not only lead nurses to explore the meaning of certain data regarding the patient's condition, inappropriate use of equipment and patient and family concerns, but also, it can encourage patients to ask questions about ambiguous and unclear information shared by nurses. However, to promote shared understanding, nurses need to avoid using language that is unfamiliar to patients.<sup>67</sup>

Finally, Direct Engagement of patients during the NBH is also a way to promote Patient Participation in care planning. This engagement in the care plan aims at empowering patients and their caregivers to adhere to the therapeutic regimen,<sup>137</sup> and to manage the therapeutic regimen after hospital discharge.<sup>22,138,139</sup> Patients' satisfaction with the engagement in care and the opportunity provided by nurses to express their questions and opinions about their own care during NBH was reported by Bradley and Mott.<sup>37</sup> In a qualitative study conducted by Drach-Zahavy and Shilman,<sup>140</sup> which explored how nurses and patients perceive the latter's engagement during NBH, reported as strategies of engagement the: 1) information exchange that helps nurses and patients to prioritize or plan care for the next shift and the 2) requests for additional information from patients to make up for insufficient information obtained from nurses finishing their shift. In addition, Direct Patient Engagement may involve requests for clarification of ambiguous information heard from patients about their own care. Some authors,<sup>130,141,142</sup> reported the use of mnemonic ISHAPED (Introduction, Story, History, Assessment, Plan, Error prevention, Dialogue) during NBH as a communication tool that envisages the establishment of a dialogue between nurses and patients to promote the latter's Direct Engagement. In addition to ISHAPED, also IPASS THE BATON, which means: introduction, patient, assessment, situation, safety concerns, background, actions, timing, ownership, and next, includes patient engagement by nurses.<sup>143</sup> In a quasi-experimental study carried out by Nemati et al,<sup>144</sup> which intended to study the effect of using "I PASS the Baton" compared with the previously used SBAR, found statistically significant differences after using "I PASS the Baton" in relation to the quality of information, interaction and support between nurses, efficiency, and patient engagement. These authors highlighted the importance of training on how to use this mnemonic to promote Patient Engagement during handover.<sup>144</sup> However, Direct Patient Engagement by nurses during NBH is not always carried out consistently.<sup>22,36,130,145</sup> For nurse managers to effectively manage the change to NBH with direct Patient Engagement, it is necessary to understand the factors that influence nurses' practice.<sup>146</sup>

## Mandatory versus Flexible NBH Practices

The exclusion of 14 items from the BHAB questionnaire can be explained by the practice of Portuguese nurses and the Change Management stage in relation to NBH. Slade et al<sup>71</sup> assessed the attitudes and behaviors of Australian nurses before implementing mandatory bedside handovers, where nurses had not yet reflected on the relevance of BHAB questionnaire items within their practice. On the contrary, the responses given by Portuguese nurses were based on experience in an institution that had implemented NBH over four years, at a Change Management stage in which nurses had already accommodated some visions and strategies developed,<sup>147</sup> to deal with the challenges of the NBH. Consequently, the degree of relevance attributed to the BHAB questionnaire items is possibly more practice-informed in the Portuguese sample than in the Australian one. Nursing practice is defined as the set of cognitive, behavioral, and social aspects of professional actions carried out by nurses to address patients' needs and fulfilling their role, including how nurses think, make decisions, transfer knowledge, and use it in specific situations or perform certain actions.<sup>148</sup> Some studies have found that NBH is performed differently than designed<sup>142</sup> and that it is not always carried out or may only involve introduction to the patient and the nurse entering the shift.<sup>149</sup> This variability has been reported in relation to

the individual practices of nurses, the duration of NBH, the method used, the place of performance, and the information transmitted and shared with patients.<sup>145</sup> Some studies have also reported the existence of inconsistencies after the implementation of NBH from both nurses and patients,<sup>72,149,150</sup> even when nurse facilitators were involved during the change process.<sup>149,151</sup> In a study by Malfait et al,<sup>53</sup> which aimed to identify differences in compliance with a structured NBH protocol across 12 services, nearly 30% of observed cases involved a unilateral decision by nurses not to conduct NBH. Additionally, in one-third of the cases where NBH was performed, nurses did not actively involve patients.

Furthermore, the difference between the *Cronbach's alpha* we obtained for the overall instrument (0.79) and that reported by Slade et al<sup>71</sup> can be explained not only by the smaller number of items but also by the variability within the sample of Portuguese nurses. The variance within the sample constitutes a factor that affects the internal reliability of measurement instruments.<sup>152</sup> The authors of the BHAB questionnaire recruited nurses from two inpatient services, whereas in this study, nurses were recruited from 10 services or units, of which almost 50% were intensive care units, operation room, labor and delivery, and emergency services. Lastly, this difference can be explained by the variable nature of NBH implementation in the hospital that hosted this study, unlike the mandatory implementation context in the study by Slade et al.<sup>71</sup> This is in line with the perspective that, during NBH, nurses may use practices that are not mandatory, resulting in different approaches.<sup>146</sup> McCloskey et al,<sup>56</sup> in a qualitative systematic review focused on patients, family, and nurses experiences, revealed that nurses use adaptive practices to manage patients and family-specific factors, as well as environmental factors that affect the NBH. Tobiano et al,<sup>45</sup> in a systematic review that explored how patient participation is promoted during NBH, also highlighted the importance of flexible approaches by nurses to confidentiality, information sensitivity, and adapting the handover process to meet patients' abilities, preferences, and expectations. Schirm et al,<sup>55</sup> in a study that involved a survey of what is known in the literature about NBH before its implementation, suggested that promoting decision making around NBH, rather than enforcing it as a mandatory practice, could reduce resistance among nurses.

## Psychometric Properties of the BHAB-PT Questionnaire

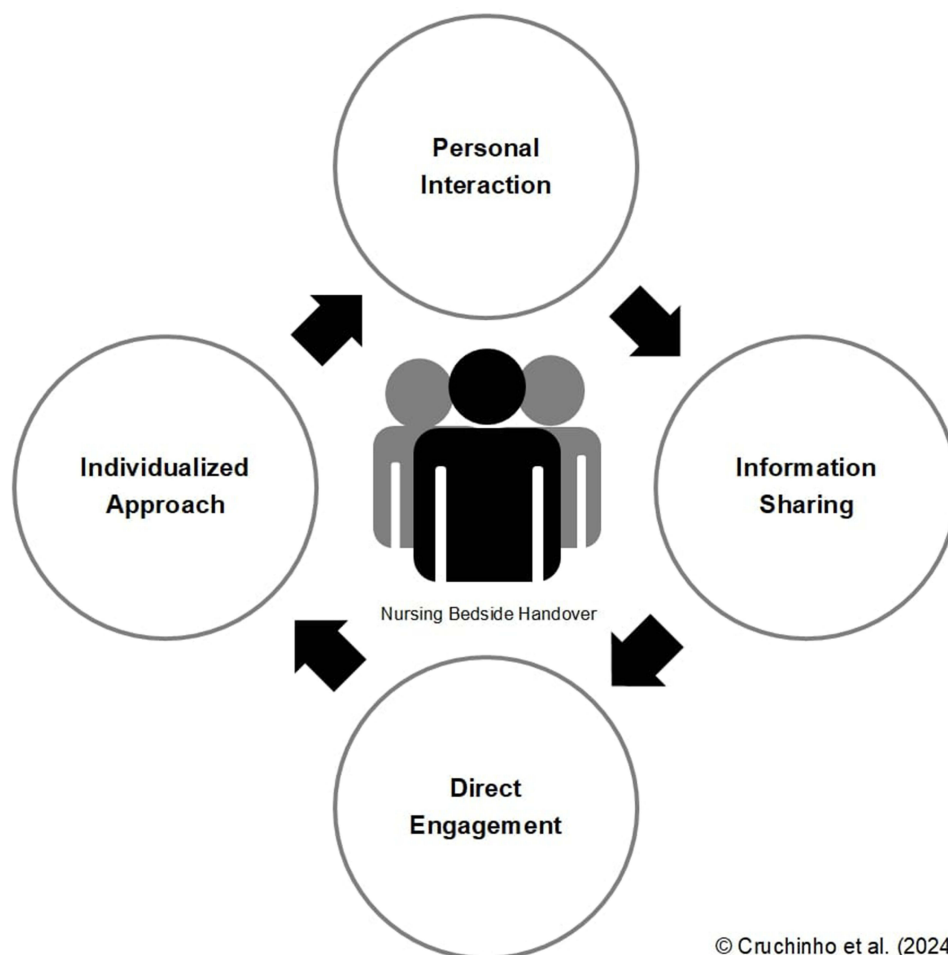
In assessing the Content Validity, Construct Validity, and Reliability of the BHAB-PT questionnaire, we followed the descriptors for assessing the methodological quality of measurement instruments of the COnsensus Based Standards for the Selection of Health Status Measurement INstrument (COSMIN).<sup>153</sup> The internal consistency assessed by *Cronbach's alpha* revealed consistency coefficients with values between 0.65 and 0.82 in the Direct Engagement, Personal Interaction, Information Sharing, and Individualized Approach dimensions. In Social Sciences, values between 0.60 and 0.70 for *Cronbach's alpha* are considered acceptable in exploratory research.<sup>154</sup> We consider validation studies as exploratory, once assessment instruments are needed to test substantive hypotheses in confirmatory studies.<sup>155</sup> In factors with lower *Cronbach's alpha*, the media inter-item correlation demonstrated adequate values. With regard to Content Validity, several elements allow us to confirm its adequacy, namely: 1) the exposure of the target population to the implementation of the NBH; 2) the engagement of nurses from the target population in all stages of the cultural adaptation process for the Portuguese population; and 3) the high levels of agreement obtained in the pre-tests for clarity and items relevance. In turn, the Construct Validity of the BHAB-PT questionnaire is also supported by: 1) the adequacy of the Item-Total Correlation coefficients for the dimensions Direct Engagement ( $0.60 \leq \text{Item-Total Correlation} \leq 0.69$ ), Personal Interaction ( $0.31 \leq \text{Item-Total Correlation} \leq 0.53$ ), Information Sharing ( $0.34 \leq \text{Item-Total Correlation} \leq 0.73$ ), and Individualized Approach ( $0.24 \leq \text{Item-Total Correlation} \leq 0.57$ ); 2) the adequacy of the Inter-Item Correlation coefficients of the four dimensions; 3) the adequacy of the sample size; and 4) the quality of the model fit subjected to CFA. Other elements supporting the Construct Validity of the BHAB-PT questionnaire resulted from the methodological approaches used in the Cross-Cultural Validity of the instrument: 1) the involvement of native translators in the "source language" and the "target language", experts in the field of NBH, an expert in the field of linguistics, and a monolingual, all independent; and 2) the use of the Committee Approach, the Multiprofessional Committee, and the Expert Panel to reach consensus on the translation and cultural adaptation of the items. Mastery of these methodological approaches is a prerequisite for validation studies such as this one. To evaluate the psychometric properties of measurement instruments, we recommend the use of guidelines for translation, adaptation and cross-cultural validation of instruments,<sup>93</sup> that

provide comprehensive information about qualitative and quantitative methodological approaches necessary for the development of validation studies.

## Refinement of the BHAB-PT Questionnaire

In the psychometric validation of the BHAB-PT questionnaire, a total of 14 items were excluded. According to Prudon,<sup>156</sup> the exclusion of items is an opportunity for researchers to refine their conceptualization of the phenomenon under study. This refinement is based on the assumption that EFA is an abductive method of theory generation that is subsequently evaluated by CFA.<sup>157,158</sup> Consequently, the four dimensions provide a new conceptual model for patient participation in NBH (Figure 2). These dimensions are consistent with the three-step process described by Thórarinsdóttir and Kristjánsson,<sup>159</sup> for patient participation in healthcare: 1) Human Connection, 2) Information Processing, and 3) Action. The Conceptual Model for Patient Participation in NBH presents NBH as a dynamic process between nurses and patients consisting of four interrelated and dynamic dimensions. This model contributes to the advancement of knowledge since only two dimensions were previously known, namely the informational dimension and the interactional dimension.<sup>78</sup> Its use can guide nurse managers and researchers to develop interventions aimed at changing nurses' attitudes and behaviors during the transition to NBH.

The adequacy of the model, together along with the internal consistency coefficients, supports the use of the BHAB-PT questionnaire and its dimensions as Summed Scale and Subscales.<sup>104</sup> This allows researchers to use the summed scores of each dimension of the total instrument to test hypotheses involving the construct.<sup>114</sup> It also allows for the reduction of assessment error and the representation of the characteristics of a concept.<sup>160</sup> Based on



**Figure 2** Conceptual Model for Patient Participation in the NBH.

this, the dimensions Individualized Approach and Personal Interaction can range between 0 and 30, and Information Sharing and Direct Engagement, between 0 and 24. Regarding the total questionnaire, the results can range between 0 and 108. The higher the questionnaire score, the greater the participation of patients during the NBH. The definition of these values, along with the achievement of a previously unknown factor structure and the refinement of the conceptualization related to NBH, led to the refinement of the BHAB questionnaire. The refinement of measurement instruments is a process fundamental to the development of reliable and valid measures, which allows improving the representation of the constructs of these instruments.<sup>161</sup>

## Conclusion

Results suggested the existence of a Patient Centeredness underlying the four dimensions of the BHAB-PT questionnaire. Furthermore, this study shows that the BHAB-PT questionnaire has good psychometric properties, making it a useful tool for Portuguese nurse managers. Having a valid and reliable instrument for Portugal allows the development of future experimental studies to evaluate the impact of change management interventions by nurse managers on the variability of nurses' practices during NBH. However, two possible limitations should be considered. First, participants were recruited from a single hospital institution using a non-probability sampling method, which may have introduced a possible sampling bias. Second, the sample size obtained corresponds to 7.5 items per participant, which may have contributed to the lower internal consistency values assessed by *Cronbach's* alpha. Nonetheless, the diversity of units and hospital services represented by participants suggests that the results of this study are broadly representative of the population of nurses using NBH in Portugal. Finally, further studies are needed to refine the BHAB-PT questionnaire's properties, particularly the psychometric properties that were not tested, such as the Criterion Validity and Hypothesis Testing, which would observe the relationships between the scores of the dimensions of the BHAB-PT questionnaire and those of other measurement instruments.

## Data Sharing Statement

All data analyzed during this study were included in this published article and its additional files.

## Ethical Approval and Informed Consent

Ethical approval was obtained from the Ethics Committee for Health of Hospital de Cascais Dr. José de Almeida [Approval No 5/CE from 03/31/2021]. Before being included in the study, all participants received written and oral information and signed an informed consent form. This study was conducted in accordance with the declaration of Helsinki.

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## Author Contributions

All authors made a significant contribution to the work reported, whether that is in the conception, study design, execution, acquisition of data, analysis and interpretation, or in all these areas; took part in drafting, revising or critically reviewing the article; gave final approval of the version to be published; have agreed on the journal to which the article has been submitted; and agree to be accountable for all aspects of the work.

## Disclosure

The authors report no conflicts of interest in this work.

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