



# Influence of oncology nurses' decision-making and personality traits on missed nursing care and related factors: A correlational study

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## ABSTRACT

**Purpose:** To identify Missed Nursing Care (MNC) and related factors, as well as analyze the influence of nurses' decision-making and personality traits on MNC in two Portuguese hospitals dedicated to cancer care.

**Methods:** A cross-sectional, multicentric, descriptive-correlational study was conducted using a convenience sample of 298 nurses working in two hospitals dedicated to cancer care. Data were collected in the first semester of 2023 using a questionnaire that included sociodemographic and professional questions and the Portuguese versions of the MISSCARE Survey, the Nursing Decision-Making Instrument (NDMI-PT), and the Ten-Item Personality Inventory (TIPI-P).

**Results:** Nurses missed care occasionally, namely in the dimensions related to *Patient empowerment/autonomy care* and *Efficacy of feeding and medication*. *Staffing, Patient volume and acuity*, and *Management and organization* were moderate to significant reasons for MNC. The flexible decision-making style was predominant (81.5%). The most prevalent personality traits were *Conscientiousness*, *Agreeableness*, and *Openness to experience*. Significant correlations were found between the four stages of the decision-making process and the personality traits and several dimensions of MNC. *Data collection to assess a patient's condition* was negatively correlated with *Team communication and Material resources*. Similarly, the *Emotional stability* trait was negatively correlated with *Team communication and Patient volume and acuity*.

**Conclusions:** This study identified MNC and factors that can influence the quality of care. It is crucial to promote nurses' training and specialization within healthcare teams, with a particular focus on enhancing some of their personality traits to make them more effective and efficient therapeutic agents.

## 1. Introduction

The increasing complexity of healthcare services poses significant challenges for resource allocation and care delivery (Edfeldt et al., 2024). Consequently, the growing demands for nursing care also require nurses to have specialized knowledge to provide timely, safe, effective, equitable, efficient, and person-centered care (Shamsi et al., 2022; Ghorbani et al., 2023; Monalisa et al., 2023)

Nurses need to manage their time to perform multiple nursing tasks and respond to patients' needs in a timely manner. Despite the care hierarchies, missed nursing care (MNC) can occur when nurses partially or totally delay or omit necessary nursing care (Kalisch, 2006; Kalisch

et al., 2009; Ball and Griffiths, 2018; Dabney et al., 2019; Chiappinotto et al., 2022; Imam et al., 2022).

MNC can be classified into several categories, depending on their typology, and are the result of deliberate decisions not to carry out certain care due to limitations of time, resources or organisational support (Recio-Saucedo et al., 2018; Chaboyer et al., 2021). Such omissions have implications for the safety of the sick person and jeopardise the quality of the care provided, causing complications that could have been avoided by carrying out this care properly.

Several factors contribute to the occurrence of MNC. Among them, excessive workload, lack of human resources and scarcity of financial resources are among the main determinants observed in different

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healthcare contexts (Nantsupawat et al., 2022). Many nurses report efficiency-related pressures that force them to prioritise urgent tasks to the detriment of preventive or follow-up care. In addition, organisational issues, such as ineffective communication between teams, can also exacerbate the situation, leading to a higher incidence of omissions in care (Amrolahi-Mishavan et al., 2022).

With regard to nurses' decision-making process, Alaseeri et al. (2021) and Farčić et al. (2020) state that it is influenced by personal factors such as personality traits, factors related to the patient and the organisation in which they work (Farčić et al., 2020; Alaseeri et al., 2021) as they influence how nurses prioritise tasks in highly complex contexts (Shamsi et al., 2022; Ghorbani et al., 2023).

Nurses with greater confidence in their abilities tend to be less likely to omit care, while those who feel insecure may prioritise urgent tasks over essential care (Alaseeri et al., 2021).

With these assumptions, this study primarily aims to characterise MNC, the reasons for their occurrence, decision-making and nurses' personality traits, and then analyze their relationships.

Understanding these factors is fundamental to developing strategies that mitigate MNC and promote a safer and more effective culture of care.

## 2. Methods

### 2.1. Study design, population and sample

This cross-sectional, multicentric, descriptive-correlational study followed the STROBE (Strengthening the Reporting of Observational Studies in Epidemiology) guidelines (Vandenbroucke et al., 2007).

The population consisted of 524 nurses working in medical and surgical inpatient units of two Portuguese hospitals dedicated to the treatment of adults with cancer.

Sample size was calculated using G\*Power 3.1 software, with a 95% confidence level to determine a moderate effect size (Faul et al., 2009), resulting in  $n = 222$ .

The inclusion criteria were being a nurse providing direct care, working in medical and surgical inpatient units of hospitals exclusively dedicated to the treatment of adults with cancer. Nurses working in pediatric inpatient units and those on sick leave were excluded from this study.

The convenience sample consisted of 298 nurses, corresponding to 87.26% of the population in hospital A and 43.8% of the population in hospital B.

### 2.2. Variables and measures

The self-administered data collection tool is divided into four sections: 1) Questions about nurses' sociodemographic and professional characteristics and the Portuguese versions of the 2) MISSCARE Survey (MISSCARE-PT), 3) the Nursing Decision-Making Instrument (NDMI-PT), and 4) the Ten-Item Personality Inventory (TIPI-P).

#### 2.2.1. Demographic and professional characteristics

The instrument collected sociodemographic data (age, gender, marital status, and education level) and professional data (professional qualifications, years of experience as a nurse, type of unit in which they worked, years of experience in the current patient care unit, job title/role, contractual relationship, shift most often worked, number of hours worked per week, number of overtime hours in the past three months, and number of patients cared for, admissions, and discharges/transfers during the last shift).

#### 2.2.2. Assessment of missed nursing care and related factors

Data on MNC and related factors were collected using the Portuguese version of the MISSCARE Survey (MISSCARE-PT), which was validated for the Portuguese population with an overall Cronbach's alpha of 0.86

(Loureiro et al., 2020). The survey includes 44 items, with the first three items assessing nurses' satisfaction with their current position, with being a nurse, and with the level of teamwork on the unit. The items are rated on a scale from 1 - *Very dissatisfied* to 5 - *Very satisfied*.

The remaining 41 items are divided into Section A about MNC (on a scale from 1 - *Always missed* to 5 - *Never missed*) and Section B about the reasons for MNC (on a scale from 1 - *Significant reason* to 4 - *Not a reason for missed care*).

Section A divides MNC into the following dimensions: *Instrumental care*, *Patient assessment and documentation*, *Timeliness of response to patient/team*, *Patient empowerment/autonomy care*, and *Efficacy of feeding and medication*. Section B includes reasons for MNC: *Team communication*, *Material resources*, *Patient volume and acuity*, *Management and organization*, and *Staffing* (Loureiro et al., 2020).

#### 2.2.3. Assessment of nursing decision-making

Nurses' decision-making was assessed using the Portuguese version of the Nursing Decision Making Instrument (NDMI-PT), which was validated for the Portuguese population with an overall Cronbach's alpha of 0.96 (Paiva et al., 2024).

It consists of 24 items rated on a 5-point Likert scale (from 1 - *Never or rarely* to 5 - *Almost always or always*) that assesses nurses' opinions about the following stages of the decision-making process: 1) Data collection to assess a patient's condition, 2) Data processing and identification of nursing problems, 3) Plans of action, and 4) Implementation of plan, monitoring, and evaluation of a patient's condition. With a total score of 120 points, specific cut-off scores were used to assess nurses' decision-making styles: analytical for scores between 24 and 67, flexible for scores between 68 and 77, and intuitive for scores between 78 and 120 (Lauri and Salanterä, 2002).

#### 2.2.4. Assessment of personality traits

Nurses' personality traits were assessed using the Portuguese version of the Ten-Item Personality Inventory (TIPI-P) (Nunes et al., 2018).

This inventory consists of 10 items rated on a 7-point Likert scale (from 1 - *Disagree strongly* to 7 - *Agree strongly*). It has five subscales: *Agreeableness* ( $\alpha = 0.07$ ), *Extraversion* ( $\alpha = 0.71$ ), *Conscientiousness* ( $\alpha = 0.54$ ), *Emotional stability* ( $\alpha = 0.68$ ), and *Openness to experience* ( $\alpha = 0.32$ ) (Nunes et al., 2018).

### 2.3. Data collection

Data were collected between January 16, 2023, and August 16, 2023. Potential participants were informed about the study's scope, objectives, and expected procedures and asked to give their informed consent. The lead researcher's contact information was provided in case of any questions, but none of the participants contacted the researcher.

Participants were informed that they had the right to withdraw from the study at any time without any harm or need for justification. Data anonymity and confidentiality were ensured through an alphanumeric coding system. Each participant completed a single questionnaire and placed it in a sealed box, which the lead researcher opened at the end of the data collection phase.

Data were processed using IBM SPSS Statistics for Windows (Version 29.0.2.0 Armonk, NY: IBM Corp).

Absolute and percentage frequency distributions were calculated, as well as summary measures (mean, standard deviation, minimum and maximum). Descriptive statistics were used to analyze the variables, as well as hypothesis testing for normal distributions (Pearson or Spearman's correlation coefficients, one-way ANOVA, or the Kruskal-Wallis test).

### 2.4. Ethical considerations

This study received a favorable opinion from the Ethics Committees of the hospitals where data were collected (Opinions: TI 18/2022 and

CES. 65/023).

### 3. Results

#### 3.1. Characteristics of participants

The majority of participants were women (85.6%), with a mean (M) age of 39.45 years and a standard deviation (SD) of 9.50 years, ranging from 23 to 65 years (Table 1). They were married (47.3%) or single (38.6%) and had been working as a nurse for a mean of 16.22 years (SD = 9.46; 1–41 years). They had been working for a mean of 11.67 years (SD = 9.54) in the units where the study was carried out: surgical (55.4%) or medical (43.3%).

Concerning their education level, 81.7% held a bachelor's degree and 17.6% held a master's degree in nursing. Most of them worked as nurses (82.6%), had an individual employment contract (69.8%), worked rotating shifts (73.8%), worked 35 h a week (65.4%), and had worked 1–20 overtime hours in the past three months (52.7%).

The participants also reported caring for a mean of four patients per shift (SD = 0.90), with a mean number of 0.98 patient admissions (SD = 1.19) and 0.79 patient discharges/transfers per shift (SD = 1.04).

#### 3.2. MNC and related factors

Participants reported being satisfied with being a nurse (M = 3.55; SD = 1.11) and adopted a neutral position regarding their satisfaction with their current position (M = 3.00; SD = 1.04) and the level of teamwork on the unit (M = 3.38; SD = 0.97).

They also reported missing some aspects of nursing care (M = 3.69; SD = 0.49), namely care tasks related to *Patient empowerment/autonomy*

(M = 3.32; SD = 0.61) and *Efficacy of feeding and medication* (M = 3.51; SD = 0.78). The aspects of care related to *Timeliness of response to patient/team* (M = 3.61; SD = 0.66), *Patient assessment and documentation* (M = 3.90; SD = 0.61), and *Instrumental care* (M = 4.12; SD = 0.61) were rarely missed (Table 2).

The most frequently missed aspects of care were “Ambulation three times per day or as ordered” (M = 2.64; SD = 0.86) in the *Patient empowerment/autonomy care* dimension and “Attend interdisciplinary care conferences whenever held” (M = 2.87; SD = 1.07) in the *Timeliness of response to patient/team* dimension.

On the other hand, the most rarely missed aspects of care were “Patient bathing/skin care” (M = 4.38; SD = 0.73), “Bedside glucose monitoring as ordered” (M = 4.26; SD = 0.71), “Monitoring intake/output” (M = 4.20; SD = 0.81), “PRN medication requests acted on within 15 min” (M = 4.15; SD = 0.79), “Hand washing” (M = 4.10; SD = 0.93), “Vital signs assessed as ordered” (M = 4.07; SD = 0.87), and “Patient discharge planning and teaching” (M = 4.01; SD = 0.88) (Supplementary file).

The participants considered the following to be moderate reasons for MNC: *Staffing* (M = 1.74; SD = 0.76), *Patient volume and acuity* (M = 1.78; SD = 0.63), and *Management and organization* (M = 2.47; SD = 0.64). On the other hand, *Material resources* (M = 2.55; SD = 0.67) and *Team communication* were considered minor reasons for MNC (Table 2).

The following aspects of care were considered significant to moderate reasons for MNC (Supplementary file): “Unexpected rise in patient volume and/or acuity on the unit” (M = 1.65; SD = 0.78), “Inadequate number of RN staff” (M = 1.69; SD = 0.86), “Urgent patient situations” (M = 1.80; SD = 0.82), “Inadequate number of assistive and/or clerical personnel” (M = 1.80; SD = 0.84), “Heavy admission and discharge activity” (M = 1.90; SD = 0.91), “Tension or communication

**Table 1**  
Sociodemographic and professional characteristics of the participants (n = 298).

Variable	N (%)	Mean	Standard deviation	Minimum	Maximum	N Missed (%)	
Age (years)	296 (99.3)	39.45	9.50	23	65	2 (0.7)	
Experience as a nurse (years)	298 (100)	16.22	9.46	1	41	0 (0)	
Experience in the current patient care unit (years)	298 (100)	11.67	9.54	0	35	0 (0)	
Variable						N (%)	N Missed (%)
Gender	Male	41 (13.8)					2 (0.7)
	Female	255 (85.6)					
Marital status	Single	115 (38.6)					2 (0.7)
	De facto union	27 (9.1)					
	Married	141 (47.3)					
	Divorced	11 (3.7)					
	Widowed	2 (0.7)					
Education level	<i>Bacharelato</i>	2 (0.7)					3 (1)
	Bachelor's degree	241 (81.7)					
	Master's degree	52 (17.6)					
	Doctoral degree	0 (0)					
Professional qualifications	None	139 (46.6)					20 (6.7)
	Postgraduate degree	56 (18.8)					
	Specialization degree	42 (14.1)					
	Both	41 (13.8)					
Unit	Medicine	129 (43.3)					4 (1.3)
	Surgery	165 (55.4)					
Job title	Nurse	246 (82.6)					3 (1)
	Specialist nurse	49 (16.4)					
	Civil service	88 (29.5)					
Contractual relationship	Individual	208 (69.8)					2 (0.7)
	Rotating	220 (73.8)					
Shift most often worked	Morning	65 (21.8)					2 (0.7)
	Afternoon	10 (3.4)					
	Evening	1 (0.3)					
	Rotating	220 (73.8)					
Worked hours per week	30 h	50 (16.8)					4 (1.3)
	35 h	195 (65.4)					
	40 h	49 (16.4)					
Overtime (quarterly)	None	53 (17.8)					3 (1)
	1–20 h	157 (52.7)					
	20–50 h	67 (22.5)					
	More than 50 h	18 (6)					

**Table 2**  
Missed nursing care and related factors for missed nursing care ( $n = 298$ ).

SATISFACTION	N (%)	Mean	Standard deviation	Minimum	Maximum	N Missed (%)
Satisfaction with the current position	298 (100)	3.00	1.04	1	5	0 (0)
Satisfaction with being a nurse	298 (100)	3.55	1.11	1	5	0 (0)
Satisfaction with the level of teamwork on the unit	298 (100)	3.38	0.97	1	5	0 (0)
MISSCARE-PT	N (%)	Mean	Standard deviation	Minimum	Maximum	N Missed (%)
<b>SECTION A</b>	<b>298 (100)</b>	<b>3.69</b>	<b>0.49</b>	<b>1.82</b>	<b>4.88</b>	<b>0 (0)</b>
Instrumental care	298 (100)	4.12	0.61	1.00	5.00	0 (0)
Patient assessment and documentation	298 (100)	3.90	0.61	2.00	5.00	0 (0)
Timeliness of response to patient/team	298 (100)	3.61	0.66	1.60	5.00	0 (0)
Patient empowerment/autonomy care	298 (100)	3.32	0.61	1.80	4.80	0 (0)
Efficacy of feeding and medication	298 (100)	3.51	0.78	1.00	5.00	0 (0)
<b>SECTION B</b>	<b>298 (100)</b>	<b>2.24</b>	<b>0.46</b>	<b>1.00</b>	<b>3.91</b>	<b>0 (0)</b>
Team communication	298 (100)	2.63	0.58	1.00	3.86	0 (0)
Material resources	298 (100)	2.55	0.67	1.00	4.00	0 (0)
Patient volume and acuity	298 (100)	1.78	0.63	1.00	4.00	0 (0)
Management and organization	298 (100)	2.47	0.64	1.00	4.00	0 (0)
Staffing	298 (100)	1.74	0.76	1.00	4.00	0 (0)

breakdowns with the medical staff" ( $M = 2.09$ ;  $SD = 0.80$ ), and "Unbalanced patient assignments" ( $M = 2.22$ ;  $SD = 0.88$ ).

All other reasons were considered moderate to minor, and none were identified as "not a reason for missed care".

### 3.3. Nurses' decision making

The nurses' mean decision-making score was 74.86 points ( $SD = 3.77$ ; 57–89). The majority (81.5%) showed a flexible decision-making style, 15.5% an intuitive style, and 3% an analytical style (Table 3).

Concerning the stages of the decision-making process, the participants showed a flexible style in the *Data collection to assess a patient's condition* ( $M = 17.79$ ;  $SD = 1.41$ ), *Data processing and identification of nursing problems* ( $M = 17.91$ ;  $SD = 1.23$ ), and *Plans of action* ( $M = 17.53$ ;  $SD = 1.38$ ) stages. The sample had an intuitive style in the *Implementation of plan, monitoring, and evaluation of a patient's condition* stage ( $M = 21.61$ ;  $SD = 2.44$ ).

A positive association was found between decision-making and professional qualifications ( $r = 0.122$ ;  $p = 0.42$ ). Nurses with specialization and postgraduate degrees were more likely to make decisions more intuitively than those without postgraduate education ( $Z = -35.751$ ;  $p = 0.012$ ).

A negative association was found between nurses' decision-making and their satisfaction with being a nurse ( $r = -0.118$ ,  $p = 0.041$ ) and with the level of teamwork on the unit ( $r = -0.156$ ,  $p = 0.007$ ), that is, the higher the nurses' level of satisfaction with their profession and teamwork, the more intuitive their decision-making style tended to be.

### 3.4. Nurses' personality traits

Concerning the personality traits assessed by the TIPI-P, the participants reported moderate agreement on *Conscientiousness* ( $M = 6.11$ ;  $SD$

$= 0.73$ ), *Agreeableness* ( $M = 5.50$ ;  $SD = 0.99$ ), and *Openness to experience* ( $M = 5.50$ ;  $SD = 1.03$ ). The sample had some level of *Extraversion* ( $M = 5.40$ ;  $SD = 1.10$ ), while *Emotional Stability* had the lowest score ( $M = 4.47$ ;  $SD = 1.32$ ) (Table 4).

An association was also found between age and personality traits. Older nurses tended to have a higher level of *Conscientiousness* ( $r = 0.155$ ;  $p = 0.007$ ) and *Emotional stability* ( $r = 0.215$ ;  $p < 0.001$ ), while displaying lower levels of *Extraversion* ( $r = -0.127$ ;  $p = 0.30$ ). With regard to the years of professional experience, more experienced nurses had higher levels of *Agreeableness* ( $r = 0.141$ ;  $p = 0.015$ ), *Conscientiousness* ( $r = 0.160$ ;  $p = 0.006$ ), and *Emotional stability* ( $r = 0.211$ ;  $p < 0.001$ ).

As for their education level, statistically significant differences were found in the *Openness to experience* dimension ( $Z = 4.015$ ;  $p = 0.019$ ). Nurses with a master's degree showed a better ability to adapt to changing environments than those with a bachelor's degree ( $p = 0.014$ ).

With regard to professional qualifications, differences were found in the *Extraversion* dimension ( $Z = 3.284$ ;  $p = 0.021$ ). Specialized nurses had a higher level of *Extraversion* than graduates ( $p = 0.013$ ).

In terms of their professional activity, a correlation was found between the number of hours worked per week and *Emotional Stability* ( $r = 0.130$ ;  $p = 0.025$ ), with significant differences ( $Z = 3.468$ ;  $p = 0.017$ ) between nurses working 30 h a week and those working 35 h ( $p = 0.007$ ) or 40 h ( $p = 0.028$ ).

An association was also found between *Conscientiousness* and satisfaction with the current position ( $r = 0.149$ ,  $p = 0.010$ ), and between *Agreeableness* and satisfaction with the level of teamwork on the unit ( $r = 0.118$ ,  $p = 0.043$ ).

**Table 3**  
Nurses' decision-making ( $n = 298$ ).

NDMI-PT: DECISION-MAKING	N (%)	Mean	Standard deviation	Minimum	Maximum	N Missed (%)
Global Decision-Making	297 (99.7)	74.86	3.77	57.00	89.00	1 (0.3)
Analytical decision-making	9 (3)					
Flexible decision-making	242 (81.5)					
Intuitive decision-making	46 (15.5)					
DECISION-MAKING PROCESS	N (%)	Mean	Standard deviation	Minimum	Maximum	N Missed (%)
Stage 1: Data collection to assess a patient's condition	297 (99.7)	17.79	1.41	13.00	23.00	1 (0.3)
Stage 2: Data processing and identification of nursing problems	297 (99.7)	17.91	1.23	13.00	24.00	1 (0.3)
Stage 3: Plans of action	297 (99.7)	17.53	1.38	12.00	22.00	1 (0.3)
Stage 4: Implementation of plan, monitoring and evaluation of a patient's condition	297 (99.7)	21.61	2.44	14.00	27.00	1 (0.3)

**Table 4**  
Nurses' personality traits (n = 298).

TIPI-P	N (%)	Mean	Standard deviation	Minimum	Maximum	N Missed (%)
Agreeableness	298 (100)	5.50	0.99	3.00	7.00	0 (0)
Extraversion	296 (99.3)	5.40	1.10	2.50	7.00	2 (0.7)
Conscientiousness	298 (100)	6.11	0.73	3.50	7.00	0 (0)
Emotional stability	298 (100)	4.47	1.32	1.50	7.00	0 (0)
Openness to experience	295 (99)	5.50	1.03	2.50	7.00	3 (1)

**3.5. Association between MNC and nurses' characteristics, decision-making, and personality traits**

An association was found between age and MNC ( $r = 0.148$ ;  $p = 0.011$ ). Older nurses tended to miss fewer aspects of nursing care in the dimensions of *Instrumental care* ( $r = 0.118$ ;  $p = 0.043$ ), *Timeliness of response to patient/team* ( $r = 0.197$ ;  $p < 0.001$ ), and *Patient empowerment/autonomy care* ( $r = 0.141$ ;  $p = 0.015$ ).

Nurses' satisfaction with their current position ( $r = 0.127$ ;  $p = 0.028$ ) and teamwork ( $r = 0.146$ ;  $p = 0.012$ ) were a protective factor against MNC.

Concerning the association between the stages of the decision-making process and MNC, a negative association was found between the *Data collection to assess a patient's condition* stage and the *Instrumental care* ( $r = -0.143$ ;  $p = 0.007$ ), *Patient assessment and documentation* ( $r = -0.123$ ;  $p = 0.017$ ), *Timeliness of response to patient/team* ( $r = -0.111$ ;  $p = 0.028$ ), and *Patient empowerment/autonomy care* ( $r = -0.145$ ;  $p = 0.006$ ) dimensions (Table 5). These results show that the more intuitive the style in this decision-making stage, the higher the incidence of MNC in these dimensions.

Stages 2 and 3 of the decision-making process (*Data processing and identification of nursing problems* and *Plans of action*) were negatively correlated with *Patient empowerment/autonomy care* ( $r = -0.116$ ;  $p = 0.022$ ) and *Patient assessment and documentation* ( $r = -0.136$ ;  $p = 0.009$ ). These results show that the more intuitive the decision-making style in these stages, the more MNC can be reported in these dimensions.

On the other hand, stage 4 of the decision-making process (*Implementation of plan, monitoring, and evaluation of a patient's condition*) correlates positively with *Instrumental care* ( $r = 0.144$ ;  $p = 0.007$ ) and *Patient assessment and documentation* ( $r = 0.192$ ;  $p < 0.001$ ). These results show that a more analytical decision-making style at this stage is a risk factor for MNC.

The *Efficacy of feeding and medication* dimension did not correlate with any stage of the decision-making process. However, "Medications administered within 30 min before or after scheduled time" correlated negatively with stage 1 of the decision-making process ( $r = -0.190$ ;  $p =$

0.001). This result indicates that the more intuitive the decision-making style, the higher the incidence of this MNC.

After analysis of the personality traits using TIPI-P, the following positive correlations were found: between *Instrumental care* and *Openness to experience* ( $r = 0.151$ ;  $p = 0.009$ ); between *Patient assessment and documentation* and *Conscientiousness* ( $r = 0.115$ ;  $p = 0.048$ ) and *Openness to experience* ( $r = 0.139$ ;  $p = 0.017$ ); between *Patient empowerment/autonomy care* and *Extraversion* ( $r = 0.131$ ;  $p = 0.024$ ), *Conscientiousness* ( $r = 0.131$ ;  $p = 0.023$ ), and *Openness to experience* ( $r = 0.133$ ;  $p = 0.022$ ); and between *Efficacy of feeding and medication* and *Conscientiousness* ( $r = 0.154$ ;  $p = 0.008$ ).

Although the *Agreeableness* trait did not correlate significantly with any MNC, an association was found between this trait and "Hand washing" ( $r = 0.118$ ;  $p = 0.042$ ).

No significant correlations were found between the *Timeliness of response to patient/team* dimension and TIPI-P personality traits. The *Emotional stability* trait did not correlate with any of the MNC listed in the MISSCARE-PT survey.

The statistically significant correlations found between the personality traits and the MNC dimensions indicate that these personality traits, when present, act as protective factors against MNC in these dimensions.

**3.6. Association between reasons for MNC and nurses' characteristics, decision-making style, and personality traits**

Data analysis revealed an association between the reasons for MNC and the participants' satisfaction with being a nurse ( $r = 0.118$ ;  $p = 0.043$ ), their current position ( $r = 0.158$ ;  $p = 0.006$ ), and teamwork ( $r = 0.279$ ;  $p < 0.001$ ). This finding suggests that the more satisfied the participants are, the fewer significant reasons for MNC are reported.

Nurses' weekly workload was also positively correlated with the identification of reasons for MNC ( $Z = 3.514$ ;  $p = 0.016$ ), namely *Material resources* ( $Z = 13.364$ ;  $p = 0.004$ ) and *Staffing* ( $Z = 33.135$ ;  $p < 0.001$ ).

Concerning *Material resources*, nurses who worked 35 h a week

**Table 5**  
Association between nurses' decision-making/personality traits and missed nursing care (n = 298).

Pearson's $\rho$ ( $\rho$ ; $p$ )	NDMI-PT				TIPI-P				
	Data collection	Data processing and identification of problems	Plans of action	Implementation and Assessment	Agreeableness	Extraversion	Conscientiousness	Emotional stability	Openness to experience
Instrumental care	<b>(-0.143; 0.007)</b>	(-0.070; 0.115)	(-0.089; 0.063)	<b>(0.144; 0.007)</b>	(0.023; 0.690)	(0.081; 0.163)	(0.108; 0.062)	(0.031; 0.596)	<b>(0.151; 0.009)</b>
Patient assessment and documentation	<b>(-0.123; 0.017)</b>	(-0.054; 0.178)	<b>(-0.136; 0.009)</b>	<b>(0.192; &lt;0.001)</b>	(-0.015; 0.792)	(0.086; 0.140)	<b>(0.115; 0.048)</b>	(0.061; 0.297)	<b>(0.139; 0.017)</b>
Timeliness of response to patient/team	<b>(-0.111; 0.028)</b>	(-0.052; 0.185)	(0.033; 0.284)	(0.078; 0.090)	(0.051; 0.376)	(-0.008; 0.887)	(0.098; 0.092)	(0.064; 0.272)	(0.010; 0.864)
Patient empowerment/autonomy care	<b>(-0.145; 0.006)</b>	<b>(-0.116; 0.022)</b>	(-0.054; 0.177)	(0.093; 0.055)	(0.082; 0.155)	<b>(0.131; 0.024)</b>	<b>(0.131; 0.023)</b>	(0.026; 0.649)	<b>(0.133; 0.022)</b>
Efficacy of feeding and medication	(-0.059; 0.0155)	(-0.061; 0.148)	(0.045; 0.221)	(0.009; 0.435)	(-0.030; 0.604)	(-0.029; 0.618)	<b>(0.154; 0.008)</b>	(0.004; 0.948)	(0.046; 0.427)

$\rho$  = product-moment correlation coefficient;  $p$  = significance.

reported fewer reasons for MNC than those who worked 40 h a week ( $p = 0.034$ ). However, those working 30 h a week identified more reasons for MNC than those working 40 h a week ( $p = 0.006$ ), especially regarding “Supplies/equipment not available when needed” ( $p = 0.001$  and  $p = 0.002$ , respectively).

In relation to *Staffing*, nurses who worked 35 h a week reported fewer reasons for MNC than those who worked 40 h ( $p = 0.034$ ). However, nurses who worked 30 h a week reported more reasons for MNC than those who worked 35 or 40 h a week ( $p = 0.006$ ). These reasons included “Inadequate number of RN staff” ( $p = 0.016$ ,  $p < 0.001$ , and  $p < 0.001$ , respectively) and “Inadequate number of assistive and/or clerical personnel” ( $p < 0.001$ ,  $p = 0.033$ , and  $p < 0.001$ , respectively).

The number of overtime hours also correlated with reasons for MNC ( $Z = 4.153$ ;  $p = 0.007$ ), namely *Management and organization* ( $Z = 10.860$ ;  $p = 0.013$ ), *Staffing* ( $Z = 10.774$ ;  $p = 0.013$ ), and *Team communication* ( $Z = 10.231$ ;  $p = 0.017$ ).

With regard to *Management and organization*, nurses who worked more than 50 overtime hours reported more reasons for MNC than those who worked between 20 and 50 overtime hours ( $p = 0.042$ ), between 1 and 20 overtime hours ( $p = 0.016$ ), or none ( $p = 0.001$ ), namely regarding “Unbalanced patient assignments” ( $p < 0.001$ ). Nurses who worked more than 50 overtime hours reported more reasons for MNC than the aforementioned groups ( $p = 0.006$ ,  $p = 0.004$ , and  $p < 0.001$ ). Nurses who worked between 20 and 50 overtime hours ( $p = 0.037$ ) and between 1 and 20 overtime hours ( $p = 0.014$ ) reported more reasons for MNC than those who kept to the schedule.

With regard to *Staffing*, nurses who worked more than 50 overtime hours ( $p = 0.016$ ) or between 20 and 50 overtime hours ( $p = 0.005$ ) reported more reasons for MNC than those who did not work overtime in “Inadequate number of assistive and/or clerical personnel” ( $p = 0.006$ ). In the groups mentioned above, nurses who worked more than 50 overtime hours ( $p = 0.029$ ) reported more reasons for MNC than those who worked between 1 and 20 overtime hours ( $p = 0.003$  and  $p = 0.006$ , respectively).

In the *Team Communication* dimension, nurses who worked between 20 and 50 overtime hours ( $p = 0.023$ ) reported more reasons for MNC than those who worked between 1 and 20 overtime hours and, in turn, this group reported more reasons than those who did not work overtime ( $p = 0.006$ ). The following reasons were considered significant: “Nursing assistant did not communicate that care was not provided” ( $p < 0.001$ ) in the aforementioned groups ( $p = 0.001$  and  $p < 0.001$ , respectively) and “Caregiver off unit or unavailable” ( $p = 0.05$ ) in the group working more than 50 h compared to those working between 20 and 50 h ( $p = 0.047$ ), and in the latter group compared to those working between 1 and 20 h ( $p = 0.039$ ).

Concerning the association between decision-making and the reasons for MNC, a negative correlation was found between stage 1 of the decision-making process (*Data collection to assess a patient’s condition*) and *Team Communication* ( $r = -0.138$ ;  $p = 0.017$ ) and *Material resources* ( $r = -0.0117$ ;  $p = 0.043$ ) (Table 6). This result shows that the more intuitive the decision-making style at these stages, the more significant reasons for MNC can be reported in these dimensions.

Although no statistically significant correlations were found between the other stages of the decision-making process and the other reasons for MNC, a correlation was found between stage 3 (*Plans of action*) and the reason for MNC “Tension or communication breakdowns with the medical staff” in the *Team Communication* dimension ( $r = 0.141$ ;  $p = 0.015$ ). This result shows that a more analytical decision-making process in the *Plans of action* stage increases the likelihood of tension or failure to communicate with the medical team being a significant reason for MNC.

The analysis of the association between personality traits and reasons for MNC revealed that *Emotional stability* correlated positively with *Team communication* ( $r = 0.158$ ;  $p = 0.006$ ) and *Patient volume and acuity* ( $r = 0.120$ ;  $p = 0.039$ ). The results indicate that nurses with greater emotional control are less likely to report ineffective communication within the multidisciplinary team or unexpected increases in workload

**Table 6**  
Association between nurses’ decision making/personality traits and reasons for missed nursing care ( $n = 298$ ).

Spearman’s $r$ ( $r$ ; $p$ )	NDMI-PT			TIPI-P					
	Data collection	Data processing and identification of problems	Plans of action	Implementation and Assessment	Agreeableness	Extraversion	Conscientiousness	Emotional stability	Openness to experience
Team communication	(-0.138; 0.017)	(-0.050; 0.392)	(-0.026; 0.652)	(-0.035; 0.544)	(0.038; 0.512)	(0.036; 0.540)	(0.006; 0.924)	(0.158; 0.006)	(0.023; 0.696)
Material resources	(-0.117; 0.043)	(0.085; 0.143)	(0.064; 0.268)	(0.005; 0.930)	(-0.020; 0.737)	(0.014; 0.810)	(-0.015; 0.799)	(0.013; 0.818)	(0.058; 0.321)
Patient volume and acuity	(-0.061; 0.298)	(0.001; 0.986)	(0.060; 0.304)	(0.098; 0.092)	(0.048; 0.409)	(-0.027; 0.645)	(-0.108; 0.061)	(0.120; 0.039)	(-0.016; 0.789)
Management and organization	(-0.079; 0.177)	(0.075; 0.198)	(-0.029; 0.614)	(0.024; 0.682)	(0.006; 0.913)	(0.013; 0.827)	(-0.076; 0.190)	(0.056; 0.336)	(-0.004; 0.946)
Staffing	(-0.095; 0.101)	(0.079; 0.173)	(0.027; 0.640)	(-0.007; 0.902)	(0.025; 0.673)	(0.024; 0.678)	(0.014; 0.809)	(0.066; 0.259)	(0.116; 0.047)

$r$  = Spearman’s rank correlation coefficient;  $p$  = significance.

as reasons for MNC.

The *Openness to experience* trait was also positively correlated with *Staffing* ( $r = 0.116$ ;  $p = 0.047$ ). This finding suggests that professionals with greater flexibility are less likely to report human resources-related issues as significant factors contributing to MNC.

Although the other personality traits did not correlate with the other reasons for MNC (Supplementary file), *Conscientiousness* correlated negatively with “Heavy admission and discharge activity” in the *Patient volume and acuity* dimension ( $r = -0.116$ ;  $p = 0.046$ ) and “Other departments did not provide the care needed” in *Management and organization* ( $r = -0.117$ ;  $p = 0.044$ ). These results show that professionals with a higher level of *Conscientiousness* are more likely to consider these reasons to be significant for MNC.

#### 4. Discussion

Despite the evidence available on MNC, the phenomenon still lacks conceptual accuracy and requires a contextual analysis of the underlying organizational and personal factors (Sarpong et al., 2023).

The mean MNC of 3.69 (SD = 0.49) is consistent with the findings of previous international studies (Imam et al., 2022; Shamsi et al., 2022; Ghorbani et al., 2023). The *Instrumental care* and *Patient assessment and documentation* dimensions included the least frequent MNC, namely “Patient bathing/skin care” (Ghorbani et al., 2023), “Vital signs assessed as ordered” (Shamsi et al., 2022; Ghorbani et al., 2023; Imam et al., 2023; Sarpong et al., 2023), “Bedside glucose monitoring as ordered” (Ghorbani et al., 2023; Imam et al., 2023; Sarpong et al., 2023), “Skin/wound care” (Ghorbani et al., 2023) and “Monitoring intake/output” (Shamsi et al., 2022).

On the other hand, as the literature indicates, higher levels of MNC were found in *Timeliness of response to patient/team*, *Patient empowerment/autonomy care*, and *Efficacy of feeding and medication* dimensions, namely in “Ambulation three times per day or as ordered” (Marková and Jarošová, 2022; Imam et al., 2023; Jędrzejczyk et al., 2023; Sarpong et al., 2023; Edfeldt et al., 2024), “Attend interdisciplinary care conferences whenever held” (Shamsi et al., 2022; Ghorbani et al., 2023; Imam et al., 2023; Sarpong et al., 2023; Edfeldt et al., 2024), “Turning patient every 2 h” (Ghorbani et al., 2023; Imam et al., 2023; Sarpong et al., 2023; Edfeldt et al., 2024), “Emotional support to patient and/or family” (Marková and Jarošová, 2022), “Setting up meals for patient who feeds themselves” (Ghorbani et al., 2023) and “Medications administered within 30 min before or after scheduled time” (Ghorbani et al., 2023).

Moderate reasons for MNC include *Staffing*, *Patient volume and acuity*, and *Management and organization*.

In line with the most recent scientific evidence, the following reasons stand out: “Unexpected rise in patient volume and/or acuity on the unit” (Amrolahi-Mishavan et al., 2022; Rahmah et al., 2022; Shamsi et al., 2022; Chiappinotto et al., 2023; Imam et al., 2023; Edfeldt et al., 2024; Papathanasiou et al., 2024), “Inadequate number of RN staff” (Amrolahi-Mishavan et al., 2022; Chiappinotto et al., 2022; Marková and Jarošová, 2022; Rahmah et al., 2022; Shamsi et al., 2022; Imam et al., 2023; Juanamasta et al., 2023; Sarpong et al., 2023; Edfeldt et al., 2024; Papathanasiou et al., 2024), “Urgent patient situations” (Amrolahi-Mishavan et al., 2022; Rahmah et al., 2022; Shamsi et al., 2022; Chiappinotto et al., 2023; Imam et al., 2023; Edfeldt et al., 2024; Papathanasiou et al., 2024), “Inadequate number of assistive and/or clerical personnel” (Amrolahi-Mishavan et al., 2022; Chiappinotto et al., 2022; Marková and Jarošová, 2022; Rahmah et al., 2022; Shamsi et al., 2022; Imam et al., 2023; Juanamasta et al., 2023; Sarpong et al., 2023; Edfeldt et al., 2024; Papathanasiou et al., 2024), “Heavy admission and discharge activity” (Amrolahi-Mishavan et al., 2022; Rahmah et al., 2022; Shamsi et al., 2022; Chiappinotto et al., 2023; Imam et al., 2023; Edfeldt et al., 2024; Papathanasiou et al., 2024) and “Unbalanced patient assignments” (Amrolahi-Mishavan et al., 2022; Rahmah et al., 2022; Shamsi et al., 2022; Chiappinotto et al., 2023; Imam et al., 2023;

Edfeldt et al., 2024; Papathanasiou et al., 2024). “Tension or communication breakdowns with the medical staff” (Rahmah et al., 2022; Chiappinotto et al., 2023; Imam et al., 2023; Jędrzejczyk et al., 2023; Monalisa et al., 2023; Papathanasiou et al., 2024) was a significant reason for MNC in the *Team communication* dimension.

This study analyzed the association between sociodemographic and professional variables and MNC and found that nurses’ satisfaction with their current position and teamwork reduces MNC, which is aligned with international studies (Gosling et al., 2003; Chiappinotto et al., 2023; Imam et al., 2023; Jędrzejczyk et al., 2023).

Nurses’ age also reduces the likelihood of MNC. Although not consistent in the studies consulted, this association has already been reported in studies suggesting that older nurses tend to miss fewer aspects of nursing care (Amrolahi-Mishavan et al., 2022).

The weekly workload also influenced the identification of reasons for MNC. Nurses working 35 h a week reported fewer reasons than those working 40 h a week, while nurses working 30 h a week reported more reasons than those working 40 h a week. Nurses working 40 h a week reported more reasons than those working 35 h a week (Monalisa et al., 2023).

The literature indicates that the lack of human and material resources is a significant risk factor for the lack of efficiency, effectiveness, and timeliness of care (Gosling et al., 2003; Chiappinotto et al., 2022, 2023; Rahmah et al., 2022; Shamsi et al., 2022; Imam et al., 2023; Jędrzejczyk et al., 2023; Sarpong et al., 2023; Edfeldt et al., 2024; Papathanasiou et al., 2024). The number of overtime hours was also reported as a significant reason for MNC, with nurses working more than 50 h per quarter reporting more reasons for MNC (Gosling et al., 2003; Amrolahi-Mishavan et al., 2022).

Nurses’ decision-making process is complex and influenced by personal, patient-related, and organizational factors (Farčić et al., 2020; Alaseeri et al., 2021). In this study, the most prevalent decision-making style was the flexible style, a characteristic of the intuitive-humanistic model in which the understanding of phenomena occurs without justification and comes from professional experience and expertise (Farčić et al., 2020; Juanamasta et al., 2023).

A correlation was found between nurses’ satisfaction with being a nurse and with teamwork and a more intuitive decision-making style, indicating that nurses use situational awareness to make concrete decisions and predict desirable practices of the patient care continuum by intuitively gathering information and applying it to the current situation (Alaseeri et al., 2021).

The scientific evidence also suggests that specialized nurses (post-graduate and specialist nurses) are more confident in making complex decisions and managing complex situations (Kim et al., 2013; Cappelletti et al., 2014; Melin-Johansson et al., 2017; Alaseeri et al., 2021; Oh et al., 2022). This study further corroborates this finding, revealing a positive correlation between professional qualifications and more intuitive decision-making styles.

*Conscientiousness*, *Agreeableness*, and *Openness to experience* are considered ideal personality traits for nurses (Melin-Johansson et al., 2017; Altuntaş et al., 2022). In this study, these personality traits had the highest scores. Satisfaction with the current position was positively correlated with *Conscientiousness*, while satisfaction with teamwork correlated with *Agreeableness*.

This reinforces the idea that self-disciplined, self-confident, altruistic, and tender professionals who comply with codes of ethics and rules and know their duties tend to feel satisfied with their current position and their work in socio-professional contexts (Janicka et al., 2020).

A statistically significant correlation was found between age and *Conscientiousness* and *Emotional Stability*, but less so for *Extraversion*, suggesting that older nurses have greater self-awareness and emotional control, but less sociability (Janicka et al., 2020; Alaseeri et al., 2021; Oh et al., 2022).

The years of professional experience were also correlated with higher levels of *Agreeableness*, *Conscientiousness*, and *Emotional Stability*.

According to the literature, more experienced professionals are more skilled at understanding clinical situations and solving health problems (Janicka et al., 2020; Alaseeri et al., 2021; Oh et al., 2022).

Nurses with a master's degree were more open to new experiences than those with a bachelor's degree. Also, professional qualifications correlated with *Extraversion*. Specialist nurses were also more likely to display this personality trait than nurses with a bachelor's degree. These findings suggest that academic and professional qualifications are effective strategies to enhance nurses' response to new, stressful situations and to improve workplace performance by enhancing individual self-efficacy (Chung et al., 2021; Zalewska and Zwierzchowska, 2022).

Nurses working 30 h a week showed greater *Emotional stability*, possibly due to the negative impact of excessive weekly hours on nurses' physical and psychological well-being, including increased stress, emotional exhaustion, or absenteeism (Amrolahi-Mishavan et al., 2022; Chiappinotto et al., 2023; Imam et al., 2023; Jędrzejczyk et al., 2023).

This study aimed to identify the organizational and individual factors that contribute to MNC, including nurses' decision-making and personality traits, and provided information to better understand the phenomenon of MNC. The results will help improve nursing care and, consequently, the quality and safety of the healthcare system.

#### 4.1. Limitations

Although the sample size was adequate, the study did not include another Portuguese hospital unit that met the selection criteria. Therefore, the results should not be generalized to describe nursing care in Portuguese institutions dedicated to cancer care.

Longitudinal studies could be carried out to monitor the evolution of the problem and assess the impact of corrective strategies on each setting analyzed.

#### 5. Conclusions

This study identified MNC and factors that compromise the quality of care for patients with cancer in two Portuguese hospitals, highlighting the importance of improving nurses' job satisfaction and decision-making skills. The identification of personality traits and decision-making styles that increase the occurrence of MNC serves as an early warning for hospital middle management, thereby enabling the identification of problems before they turn into adverse events. MNC are more prevalent in the *Patient empowerment/autonomy care*, *Efficacy of feeding and medication*, and *Timeliness of response to patient/team* dimensions, indicating that nurses remain more focused on the physical dimension of care and interdependent care than on autonomous nursing care. The reasons for MNC, especially those related to *Staffing*, *Patient volume and acuity*, and *Management and organization*, highlight the need to improve conditions in the units and their organization to ensure the quality of care. Given that nurses' job satisfaction is a protective factor for the quality of care, it is important to try to meet these requirements in health care units. At the individual level, in order to demonstrate adaptability and flexibility, nurses who provide care in the analyzed contexts must be invited to develop personal strategies to shape their "personal self" to professional demands and ensure the adequacy of their personality traits. and its decision-making compatible with the highest standards of care quality. Nurse managers should take into account nurses' personality traits and promote their personal, academic, and professional development in order to monitor nursing decision-making and thus reduce MNC. Future studies should explore nurse managers' views of strategies to promote the personal and professional development of nurses in their teams. Nursing leaders should create and maintain morally safe environments and support the development of knowledge, competencies, decision-making skills, and personality traits based on the values of altruism, compassion, and honesty in professional practice.

#### CRedit authorship contribution statement

**Ivo C.S. Paiva:** Writing – review & editing, Writing – original draft, Software, Methodology, Investigation, Formal analysis, Data curation, Conceptualization. **Filipa I.Q.S. Ventura:** Writing – review & editing, Writing – original draft, Supervision, Project administration, Methodology, Formal analysis, Conceptualization. **António C.L. Vilela:** Writing – review & editing, Supervision, Project administration, Methodology, Investigation, Conceptualization. **Isabel M.P.B. Moreira:** Writing – review & editing, Validation, Supervision, Project administration, Methodology, Formal analysis, Conceptualization.

#### Declaration of competing interest

The authors declare that there are no conflicts of interest regarding the publication of this paper.

#### Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.ejon.2024.102749>.

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