Development of the revised pressure ulcer guideline in institutional healthcare organisations

Facilitators and barriers that determine the decision of stakeholders who are involved in the implementation process of the revised guideline

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Abstract

Rationale: The implementation of pressure ulcer (PU) guidelines is often not performed in daily practice and adherence is low. PUs represent a major burden to patients and have a negative effect on quality of life. The low level of adherence for PU prevention indicates a continued need for quality improvement. In 2019, the PU guideline was revised, and will be implemented in 2020. An essential first step of implementation is to assess barriers and facilitators, according to healthcare professionals (HCPs) working in institutional healthcare organisations in the Netherlands.

Aim: To investigate the barriers and facilitators, according to stakeholders, for implementation of the revised pressure ulcer guideline in healthcare organisations in the Netherlands.

Methods: The study had a cross-sectional design. We collected data from HCPs (n=89) based on the Measurement Instrument for Determinants of Innovation (MIDI) in healthcare organisations in the Netherlands. Descriptive statistics were used to explore participants characteristics. MIDI items to which ≥20% of participants (totally) disagreed were regarded as barriers and items to which ≥80% of participants (totally) agreed were regarded as facilitators for implementation. Applicability about the recommendations of the revised guideline were asked. Open-ended questions were analyzed by theme.

Results: Reported barriers to implementing the PU guideline were related to the own organisation like time. Reported facilitators were mainly related to the user like knowledge. Additionally, HCPs expressed the need for clarity of the recommendation about the European classification system. Also the recommendation about changing body position every 4 hours was not feasible.

Conclusion: An overview of the barriers and facilitators to the implementation of the PU guideline in the Netherlands is given. More barriers have been found.

Implications of key findings: The results of this study will be used to develop strategies for implementation.

Key words: Pressure Ulcer [MeSH] – Healthcare provider [MeSH] – Practice Guideline [MeSH] – Implementation Science [MeSH] – cross-sectional study [MeSH]

Samenvatting

Achtergrond: De implementatie van richtlijnen voor decubitus wordt vaak niet uitgevoerd in de dagelijkse praktijk. Decubitus vormt een grote belasting voor patiënten en hebben een negatief effect op de kwaliteit van leven. Het niet uitvoeren van decubitus preventie, indiceert een aanhoudende behoefte aan kwaliteitsverbetering. In 2019 is de decubitus richtlijn herzien en wordt in 2020 geïmplementeerd. Een essentiële eerste stap van implementatie is het beoordelen van bevorderende en belemmerende factoren, volgens zorgprofessionals werkzaam bij intramurale zorgorganisaties in Nederland.

Doelstelling: Het onderzoeken van bevorderende en belemmerende factoren, volgens zorgprofessionals, voor de implementatie van de herziene decubitus richtlijn in intramurale zorgorganisaties in Nederland.

Methode: Een cross-sectionele studie werd uitgevoerd. Data werd verzameld van zorgprofessionals (n=98) gebaseerd op het Meetinstrument voor Determinanten van Innovaties (MID) in zorgorganisaties in Nederland. Beschrijvende statistieken zijn gebruikt om karakteristieken te beschrijven. MIDI items waarbij ≥20% van de participanten (helemaal) mee oneens scoorde, warden gedefinieerd als belemmering. MIDI items waarbij ≥80% (helemaal) mee eens scoorde, warden gedefinieerd als bevorderende factor voor implementatie. Toepasbaarheid van de aanbevelingen in de richtlijnen werden uitgevraagd, waarbij open vragen zijn geanalyseerd op thema.

Resultaten: Gerapporteerde belemmeringen ten aanzien van de implementatie voor de decubitus richtlijn waren met name gerelateerd aan de eigen organisatie van de zorgprofessional zoals tijd. Gerapporteerde bevorderende factoren waren voornamelijk gerelateerd aan de zorgprofessional zelf zoals kennis. Ten aanzien van de aanbevelingen gaven zorgprofessionals aan dat het Europese classificatie systeem niet bekend is. Daarnaast is de aanbeveling ten aanzien van wisselligging elke 4 uur niet haalbaar.

Conclusie: Een overzicht van de belemmerende en bevorderen factoren is gegeven voor de implementatie van de decubitus richtlijn in Nederland. Meer belemmerende factoren zijn gevonden.

Aanbevelingen: De resultaten van deze studie zullen worden gebruikt bij het bepalen van strategieën voor de implementatie van de richtlijn.

Trefwoorden: Decubitus, belemmerende en bevorderen factoren, implementatie onderzoek, richtlijn, zorgprofessional

Introduction

Background

Guidelines are important to improve quality of care[1,2], and are considered an essential item for healthcare policy, planning, evaluation and quality improvement by clinicians, managers and policymakers[3]. The limited use of guidelines contributes to the omission of beneficial therapies, preventable harm, suboptimal patient outcomes or experiences or a waste of resources[4,5]. Several studies have investigated the results of the implementation of and adherence to guidelines in healthcare and concluded that guidelines are disappointing and were often not implemented in daily practice[6–8]. It is difficult to identify factors that predict the probability of implementation success. Specific strategies could be developed to accomplish a more successful implementation[9].

Implementation can be described as a process-based introduction of innovations and/or improvements with the aim of giving them a structural place in professional behaviour, in functioning of organisations or in the structure of healthcare[10]. To support guideline implementation, tools for identifying barriers and choosing interventions have been developed. The implementation model of Grol and Wensing (2017) is a tool for effective implementation of innovations, new guidelines or new work methods[2]. An analysis of the target group and context, with barriers and facilitators, is an essential step of this model to gain insight into the implementation strategies that will support an implementation process. When barriers and facilitators are known, strategies can be tailored to overcome these barriers to the implementation of guidelines.

Several studies have shown that pressure ulcer guidelines lack implementation in daily practice and adherence is low[6,7,11,12]. Pressure ulcers are preventable adverse events and represent a major burden to the patient and their family members; they also have a negative effect on quality of life[13–17]. For instance, pressure ulcers have an impact on physical functioning (e.g. mobility, daily activities), psychological wellbeing (e.g. mood, anxiety) and social functioning (e.g. participation, isolation)[18–23]. Pressure ulcers also have an impact on social interest. The cost of pressure ulcers is high and positively correlated to the severity of the pressure ulcer[24]. The total costs for pressure ulcer care varies from $500 million, which is approximately 1.2% of the total healthcare costs in the Netherlands (based on low estimations), to around $2 billion, or approximately 6.6% of total healthcare costs in the Netherlands[25–27].

According to the most recent report of the Dutch National Prevalence Measurement of Care Problems, the prevalence of pressure ulcers in the Dutch hospital sector is highest at 8.8%[26]. In institutions with long-term stays, the prevalence of pressure ulcers is 7.1%. The low level of adherence for pressure ulcer prevention indicates a continuous need for quality improvement, particularly for some guidelines[11]. This means that prevention and treatment can still be improved and that an up-to-date quality standard is essential.

The current Dutch Nurses' Association (V&VN) guideline prevention and treatment of pressure ulcers of 2011 is based on the European Pressure Ulcer Advisory Panel and National Pressure Ulcer Advisory Panel (EPUAP/NPUAP) guideline of 2009[28]. In November 2019, the EPUAP/NPUAP guideline was revised, in which new evidence emerged[29]. The new information was used for the revised Dutch pressure ulcer guideline which will be implemented in 2020. Since 2018, a workgroup has been involved in the development of pressure ulcer guideline commissioned by the V&VN.

Research showed that some aspects of the prevention and treatment of pressure ulcers from the Dutch guidelines are not followed[32]. Despite the existing guidelines being updated, along with their implementation, adherence is low[6,7,33,34]. For this reason, attention to the implementation of the guidelines is recommended to reduce this high prevalence of pressure ulcers. An essential implementing first step, and therefore the aim of this study, is to assess barriers and facilitators, according to stakeholders working in institutional healthcare organisations in the Netherlands, to the implementation of revised guidelines in hospitals and long-term stay[2].

Objectives

This study aims to investigate the barriers and facilitators of stakeholders in institutional healthcare organisations in the Netherlands for the implementation of the pressure ulcer guideline.

Methods

Design and setting

A cross-sectional design was used via an online questionnaire and was conducted from March until May 2020 by stakeholders in institutional healthcare organisations (i.e. nursing homes, (academic) hospitals and specialised homes for long-term care) in the Netherlands.

Population and sample

The stakeholders for this study were healthcare professionals (HCP) who were involved in the care or policy of patients in the prevention or treatment of pressure ulcers in institutional healthcare organisations in the Netherlands. A convenience sample was conducted and the following stake holders were included in this study: (student) nurses with different levels of education, paramedics, medical doctors, physician assistants, nurse specialists, managers and policy makers.

Data collection procedure and assessment instruments

Data were collected by an online questionnaire which was provided by Limesurvey version 3.22.12[32]. The online questionnaire was provided by and administered by the researcher. The questionnaire consisted of three parts: characteristics of the participants, the Measurement Instrument for Determinants of Innovations (MIDI) questionnaire and questions about the applicability of the recommendations of the revised guideline.

Three strategies were used for data collection. First, the workgroup, commissioned by the V&VN of the revised guideline, identified and approached key individuals in institutional healthcare organisations to take part in the study. The researcher gave instructions to the workgroup and prepared the email to the key persons. The key individuals were asked to forward the questionnaire by email to healthcare professionals in their organisation. Besides this, the supervisor (BvG) and researcher (ES) of this research used their own network and invited stakeholders to fill out the online questionnaire. The questionnaire was also spread via social media like LinkedIn and Twitter.

The first part of the questionnaire consisted of an initial section for participants' demographics and background, such as gender, age, profession, and years of work experience.

The second part of the questionnaire consisted of the barriers and facilitators and were measured by a validated questionnaire that consisted of determinants of innovations that may affect implementation. This was achieved by using the evidence-based MIDI[32]. This instrument was designed to improve the understanding of how critical determinants affect the implementation of innovations within larger healthcare organisations, allowing a more precise targeting of the innovation strategies applied. MIDI captures 29 determinants in 4 scales to be evaluated by healthcare professionals who are adopting the pressure ulcer guideline (Table 1). The first category is related to the pressure ulcer guideline (1-7), the

second to the adopting user (8-18), the third to the organisation (19-28), and the fourth to the socio-political context (29). The determinant associated with the user, self-efficacy, was asked in the questions about the applicability of the recommendations so that no questions were duplicated.

The third part of the questionnaire consisted of items to explore the applicability of the recommendations of the revised guideline; nine essential recommendations were measured with a 10-point Likert scale. These recommendations gained insight in the usability of the revised guideline in institutional healthcare organisations. If the respondent scored lower than 6 on the Likert scale, an open-ended question was asked about the usability of the recommendation.

In order to ensure usability and completeness of the questionnaire, several iterations were performed, within the research group of three persons involved in the research. Data were included for analysis when the MIDI was completed.

Table 1: Overview of MIDI determinants, number of items, and response scales

Data analysis

The IBM SPSS statistics version 25 was used for data analysis[33]. After research and consultation with the supervisor (BvG), we defined MIDI items to which ≥20% of participants responded with 'totally disagree/disagree' as barriers and those to which ≥80% of participants responded with 'agree/totally agree' as facilitators for implementation. Descriptive statistics (mean, standard deviation, counts and percentage) were applied to the participant characteristics and MIDI scores.

Descriptive statistics (counts, IQR, minimum and maximum) were used to evaluate the applicability of the recommendations of the revised pressure ulcer guidelines. After a Delphi procedure with the research group, a median of ≥ 7 was considered applicable. If the median was ≤ 6, these were considered not applicable. Open-ended questions were analysed if a stakeholder scored ≤ 4. Each open-ended question was categorised and subthemes were made.

No response rate could be measured because of the snowball method it is unclear how many stakeholders received the questionnaire.

Ethical issues

The study was conducted according to the principles of the declaration of Helsinki[44], the guidelines for Good Clinical Practice[45], and the European law General Data Protection Regulation(AVG)[46]. It was not necessary to have the study assessed by the medical ethical committee (METC) because participants were not subjected to actions and no behaviour was imposed on them[47]. Informed consent was signed by the respondents by clicking a box of the online survey. By not clicking this box, the questionnaire could not be completed.

Data will be stored, conforming to laws and regulations, on a separate internal network drive for research data at the University of Applied sciences Nijmegen for 10 years.

Results

Response and study samples

Data of 106 stakeholders were collected. Because they did not complete the MIDI, seven (6.6%) of the cases were excluded. In total, 99 participants were included in the analysis of characteristics and 28 determinants of the MIDI. Data on 89 stakeholders about the recommendations and determinant self-efficacy were collected and analysed. In total there were 17 cases with incomplete data (16.0%).

Descriptive analysis of study samples

The characteristics of the stakeholders are represented in Table 2. It was observed that high percentages of studied stakeholders were female (88.9%). The average age was 36.5 years (sd = 11.83) and the mean years of work experience was 9.3 (sd = 9.93). Each subgroup, including medics, paramedics, nurses and management, is represented.

Table 2: Characteristics of the stakeholders (N=99)

Outcome measures

Measurement Instrument of Determinants for innovation

A number of facilitators and barriers is present. Table 3 showed the results of the determinants.

Table 3: Results of the MIDI; barriers and facilitators

Determinants associated with the pressure ulcer guideline

No ***facilitators*** were identified according to the determinants associated with the guideline. Correctness of the guideline scored highest (74.8%) on 'totally agree' or 'agree'. According to the determinants associated with the pressure ulcer guideline, no ***barriers*** were identified. Respectively observability (14.1%), the visibility of the outcomes for the user, and complexity (12.1%), degree to which implementation of the pressure ulcer guideline is complex, scored highest on total disagree or disagree.

Determinants associated with the user

According to the determinants associated with the user, eight ***facilitators*** were identified. Three facilitators of self-efficacy, the degree to which the user believes it is able to implement the activities involved in the pressure ulcer guideline, scored highest; risk assessment (94.4%), cooperating agreements (88.9%), and mattress selecting (87.8%). Other facilitators were the importance of the outcome expectation (83.9%) and the outcome expectation by treatment (82.8%). The health care professionals scored 81.1% 'agree/totally agree' according the determinant professional obligation, the degree to which the pressure ulcer guideline fits in with the tasks for which the user feels responsible. Further, 80.8% 'agree/totally agree' of the respondents complied with the opinions of the nurses and know enough to use the innovation.

Two of the thirty-two determinants associated with the user were identified as a ***barrier***. The descriptive norm, the proportion of the colleagues for whom the innovation is intended and actually use the innovation, was reported by 53.5% of all healthcare professionals. Regarding the awareness of content, the degree to which the user has learnt about the content of the pressure ulcer guideline, 32.3% disagree or totally disagree.

Determinants associated with the organisation

No ***facilitators*** were identified according to the determinants associated with the organisation.

Eight ***barriers*** were identified according to the determinants associated with the organisation. The question about other changes in the organisation which affect the implementation of the pressure ulcer guideline was answered with 'yes' by 79.8% of the healthcare professionals. This is the most pronounced barrier. The presence of one or more persons responsible for coordinating the implementation of the innovation is reported with 'no' by 49.5% of the health care professionals. On the other hand 49.5% 'disagree' or 'totally disagree' about the feedback to the user about progress with the innovation process, and 53.5% did not perceive formal ratification of the innovation by management. Replacement

when staff leave is also identified as a barrier, 32.3% disagree or totally disagree of the healthcare professionals. Other barriers were staff capacity (29.3%), time available (24.2%) and financial resources (20.2%).

Determinant associated with the socio-political context

No ***facilitator*** nor ***barrier*** was identified according to the determinant associated with the socio-political context.

Applicability of recommendations of the revised pressure ulcer guideline

Figure 1 showed boxplots of the results of the recommendations. The nine recommendations were overall considered as applicable. The median of the recommendations is minimal 7 and maximum 8, with an IQR of maximum 2.

Figure 1: Boxplots of the recommendations of the pressure ulcer guideline

Some stakeholders considered some recommendation not to be applicable. The recommendations about using the international EPUAP/NPUAP classification system, performing skin assessment as soon as possible but within 8 hours and encouraging self-management had a range from 3-10. A change of body position was also considered not applicable by some respondents, with a range from 2 to 10. The open-ended questions of these recommendations were analysed.

The open-ended question about the classification system is answered by 27 respondents; however, 24 of them answered the question by saying that they do not know the EPUAP/NPUAP classification system. Ten out of twenty-nine respondents answered the question about performing skin assessment as soon as possible but within 8 hours, which is not related to their function. Other answers on the open-ended question were no attention to skin assessment (n=7) or lack of knowledge (n=5). According to encouraging self-management, the open-ended questions were answered by 26 respondents. More than half of the respondents (n=15) to the question answered that clients/patients were not capable to do self-management. The open-ended question about change of body position every 4 hours was answered by 25 respondents. Ten respondents answered that it is not applicable because of workload or time. Five respondents answered that it is not applicable because of the preferred or necessary position of the client.

Discussion

The purpose of this study was to examine barriers and facilitators for the implementation of the revised pressure ulcer guideline in healthcare organisations in the Netherlands. Ten barriers and seven facilitators were identified. Mainly, barriers were reported as one of the determinants associated with the organisation, such as a lack of resources in an organisation (i.e. replacement and capacity of staff, time), performance feedback or organisational changes. According to the determinants associated with the user, the proportion of the colleagues for whom the guideline is intended, actually use the guideline, and regard awareness of the content were identified as barriers. The seven facilitators to implementing the revised pressure ulcer guideline were all user related. Three facilitators in self-efficacy scored highest as the facilitator. The importance of the outcome expectation, prevent or treat pressure ulcer, and the outcome expectation by treatment of pressure ulcer were also identified as facilitator. The nine recommendations of the revised guideline were overall considered as applicable. Any recommendations were not applicable by some stakeholders. Mostly because of used terminology, workload or time and not capable for the patient group.

Previous studies reported implementation barriers related to the organisation, included leadership style, finances and time; these factors can negatively impact the implementation process[38–40]. These factors were also reported as barriers in this study and can negatively influence the implementation of the pressure ulcer guideline. According to Greenhalgh et al. (2004), using people's and organisations' needs and experiences in everyday life practice as a starting point for the implementation or dissemination of an innovation[41]. In this study, the needs and experiences of healthcare professionals is the starting point for the implementation of pressure ulcer guideline. Facilitators were found and appropriate actions will be used to integrate the pressure ulcer guideline in practice.

The use in this study of reported facilitators like 'outcome expectation' are in line with another Dutch implementation study[42]. The identified facilitators also revealed that healthcare professionals need to experience what the guideline can add to the patient care. Positive experiences with the guideline, is an important factor. Therefore health care professionals and students should be prepared for the implementation of the revised pressure ulcer guideline.

Identifying implementation barriers and facilitators help nurse leaders and healthcare providers to select strategies that support the implementation of clinical practice guidelines. This study has identified the barriers and facilitators that will influence the upcoming implementation of the revised pressure ulcer guideline. Identifying the barriers and

facilitators contributes to successful implementation, although not without complications. The barriers identified in this study stress the urgency of providing a coordinator in an organisation to support the implementation and monitoring the pressure ulcer guideline.

In this study, nearly half of the stakeholders had no coordinator in their organisation. However, having a coordinator who is responsible for implementation for a guideline in an organisation is essential for intervention adoption, successful implementation and sustainability[39,40]. A coordinator can confirm support encourage adoption[43]. Continued support includes support for staff from other staff members to share positive and negative experiences using the innovation, like telephone or face-to-face contact with researchers, management support and the allocation of organizational resources. An example is given in Kapp's study (2013) where nurses provided telephone and email support throughout implementation. Practice guidelines were successfully implemented and pressure risk screening became a well-adopted practice[44].

Another implication is for research. Future research can investigate if there is a need of different implementation strategies between de different domains and whether and how barriers and facilitators to implementing the pressure ulcer guideline change over time by comparing the outcomes of the MIDI performed shortly after start of the implementation and two years later. Additionally an evaluation of whether certain implementation strategies are effective is also recommended.

This study has several strengths and limitations. The design of online data collection was chosen because Dutch healthcare professionals are well versed in information technology. The online survey could be used to prevent non-response to items. Despite the advantage of an online survey, seven cases were incomplete (6.6%) and only 89 completed the questionnaire. Another limitation is the low number of respondents who completed the online questionnaire. Because of COVID-19, no reminders were sent because of the work pressure in healthcare organisations. It is not clear how the limited responses affected study results, because detailed characteristics of non-responders were unknown. Additionally, using different sources of information is another weakness of this study. The choice to collect data in different healthcare organisations lead to a broad insight of the barriers and facilitators in Dutch healthcare organisations. These barriers and facilitators cannot be translated to a specific organisation. Another limitation is the proportionality of the respondents according to gender. Most of the respondents were female (88.9%), which is consistent with the Dutch scenario where mainly female healthcare professionals exist[43].

A strength of this study is the involvement of stakeholders from different specialties, like medics, paramedics, nurses and management. This enabled the identification of a wide range of factors affecting implementation from different perspectives. Therefore we will be able to develop tools that are broad strategies, engage different stakeholders, and could be easily integrated into existing routines. The statistically differences in this study between the domains, should be taken into account by developing implementation strategies. Another strength is the evaluation of the recommendations of the guideline using a combination of quantitative and qualitative data through questionnaires. This combination resulted in reliable and broad insight into both the effects of the innovation on perceived factors affecting implementation and the quality of the innovation while also providing indications for improvement.

This is the first study to evaluate the implementation of the pressure ulcer guideline in Dutch healthcare organisations. This study can lead to the development of tailored implementation strategies for the implementation of the pressure ulcer guidelines in the intramural setting.

Conclusion

The stakeholders in institutional healthcare organisations gave an overview of the barriers and facilitators for the implementation of the guideline pressure ulcers in the Netherlands. In this study, more barriers have been found which should be taken into account when planning strategies in implementing the use of the guideline. Appointing a coordinator in organisations can contribute to the correct implementation of the pressure ulcer guideline.

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Tables and figures

Table 1: Overview of MIDI determinants, number of items, and response scales

Determinants associated with the innovation	No of items	Scale
1. Procedural clarity [a]	1	1-5
2. Correctness [a]	1	1-5
3. Completeness [a]	1	1-5
4. Complexity [b]	1	1-5
5. Compatibility [a]	1	1-5
6. Observability [a]	1	1-5
7. Relevance for client [a]	1	1-5
Determinants associated with the user		
8a. Personal benefits [a]	1	1-5
8b. Personal drawback [b]	1	1-5
9a. Outcome expectation, importance [a]	1	1-5
9b. Outcome expectation, probability [c]	3	1-5
17. Professional obligation [a]	1	1-5
18. Client satisfaction [a]	1	1-5
19. Client cooperation [a]	1	1-5
20. Social support [a]	2	1-5
21. Descriptive norm [d]	1	1-7
15a. Subjective norm, normative beliefs [c]	3	1-5
15b. Subjective norm, motivation to comply [e]	6	1-5
16. Self-efficacy h	9	1-10
17. Knowledge [a]	1	1-5
18. Awareness of content [f]	1	1-4
Determinants associated with the organisation		
19. Formal ratification by management [g]	1	1-2
20. Replacement when staff leave [a]	1	1-5
21. Staff capacity [a]	1	1-5
22. Financial resources [a]	1	1-5
23. Time available [a]	1	1-5
24. Material resources and facilities [a]	1	1-5
25. Coordinator [g]	1	1-2
26. Unsettled organisation [g]	1	1-2
27. Information accessible about use of innovation [a]	1	1-5
28. Performance feedback [a]	1	1-5
Determinants associated with the socio-political context		
29. Legislation and regulations [a]	1	1-5

Response scales: a 1: totally disagree, 2: disagree, 3: neither agree nor disagree, 4: agree, 5: totally agree. b 1: totally agree, 2: agree, 3: neither agree nor disagree, 4: disagree, 5: totally disagree. c 1: most definitely not, 2: definitely not, 3: perhaps, perhaps not, 4: definitely, 5: most definitely. d 1: not a single colleague, 2: almost no colleagues, 3: a minority, 4: half, 5: a majority, 6: almost all colleagues, 7: all colleagues. e 1: very little, 2: little, 3: not a little, 4: a lot, 5: a great deal. f 1: I'm not familiar with the revised PU guideline, 2: I'm familiar with the revised PU guideline, but have not explored it, 3: I'm familiar with the revised PU guideline and have some experience with it, 4: I'm well acquainted with and use the revised PU guideline. g 1: no, 2: yes. h 1: certainly not applicable – 10: certainly applicable.

Table 2: Distribution of studied stakeholders regarding sociodemographic characteristics (N=99)

Sociodemographic characteristics	**Total, N=99**
	N
Sex	
Female	88
Age (years)	
Mean (SD)	36.5±11.83
Professional domain	
Nurses	58
Paramedics	28
Medics	8
Management	5
Work experience (years)	
Mean (SD)	9.3±9.93

Table 3: Results of the MIDI; barriers and facilitators

MIDI	N	Mean	SD	TD/D (%)	A/TA (%)
Determinants associated with the innovation					
1. Procedural clarity	99	3.64	0.71	8.1	66.7
2. Correctness	99	3.81	0.63	3.0	74.8
3. Completeness	99	3.64	0.71	4.0	61.6
4. Complexity	99	3.71	0.98	12.1	63.6
5. Compatibility	99	3.66	0.86	6.1	64.6
6. Observability	99	3.19	0.78	14.1	35.3
7. Relevance for client	99	3.68	0.83	9.1	68.7
Determinants associated with the user					
8a. Personal benefits	99	3.32	0.81	11.1	42.4
8b. Personal drawback	99	3.62	0.75	2.0	52.5
9. Outcome expectation, importance	99	3.19	0.79	2.0	**83.9**
9a. Outcome expectation, probability					
9a1. Prevent	99	3.45	0.92	11.1	56.6
9a2. Treatment	99	3.99	0.69	2.0	**82.8**
9a3. Recover	99	3.34	0.86	12.1	48.5
10. Professional obligation	99	4.14	0.90	5.1	**81.8**
11. Client satisfaction	99	3.51	0.71	5.1	51.6
12. Client cooperation	99	3.52	0.71	4.0	50.5
13a. Social support intern	99	3.67	0.66	4.0	64.7
13b. Social support extern	99	3.40	0.68	5.1	42.4
14. Descriptive norm	99	3.80	1.33	**53.5**	31.3
15a. Subjective norm, normative beliefs					
15a1. Colleagues	99	0.76	0.85	5.1	68.7
15a2. Financiers	99	0.88	0.76	3.0	73.8
15a3. Clients	99	0.47	0.81	7.1	47.5
15b. Subjective norm, motivation to comply					
15b1. Carers	99	3.56	0.84	10.1	59.6
15b2. Nurses	99	3.98	0.67	2.0	**80.8**

15b3. Paramedic	99	3.84	0.75	5.1	75.7
15b4. Medics	99	3.86	0.70	4.0	78.8
15b5. Managers	99	3.22	0.89	18.2	40.4
15b6. Client	99	4.01	0.71	2.0	79.8
16. Self-efficacy					
16a1. Risk assessment	90	8.04	0.99	0.0	94.4
16a2. Classification system	90	6.71	2.29	14.4	68.9
16a3. Change of body position	90	7.14	2.15	10.0	72.3
16a4. Mattress selecting	90	8.16	1.56	2.2	**87.8**
16a5. Skin assessment	89	6.81	1.99	9.0	67.5
16a6. Nutrition status	89	7.35	2.03	7.9	79.7
16a7. Self-management	89	9.67	1.70	6.7	70.8
16a8. Care plan	89	7.13	1.60	5.6	68.6
16a9. Cooperating agreements	89	7.69	1.41	2.2	**88.9**
22. Knowledge	99	3.98	0.73	4.0	**80.8**
23. Awareness of content	99	2.72	0.93	**32.3**	67.7
Determinants associated with the organisation					
24. Formal ratification by management	99	1.54	0.50	**53.5**	46.5
25. Replacement when staff leave	99	2.79	0.82	**32.3**	15.1
26. Staff capacity	99	3.00	0.85	**29.3**	32.3
27. Financial resources	99	3.16	0.85	**20.2**	36.3
28. Time available	99	3.16	0.90	**24.2**	33.4
29. Material resources and facilities	99	3.37	0.88	14.1	48.5
30. Coordinator	99	1.49	0.50	**49.5**	50.5
31. Unsettled organisation	99	1.80	0.40	**79.8**	20.2
32. Information accessible about use of innovation	99	3.38	0.96	19.2	52.5
33. Performance feedback	99	2.64	1.00	**49.5**	18.2
Determinants associated with the socio-political context					
34. Legislation and regulations	99	3.64	0.69	2.0	55.6

Abbreviations: TD/D totally disagree/disagree, A/TA agree/totally agree. TD/D ≥20% indicates that the determinant is a barrier to the implementation. A/TA value ≥80% indicates that the determinant is a facilitator to the implementation.

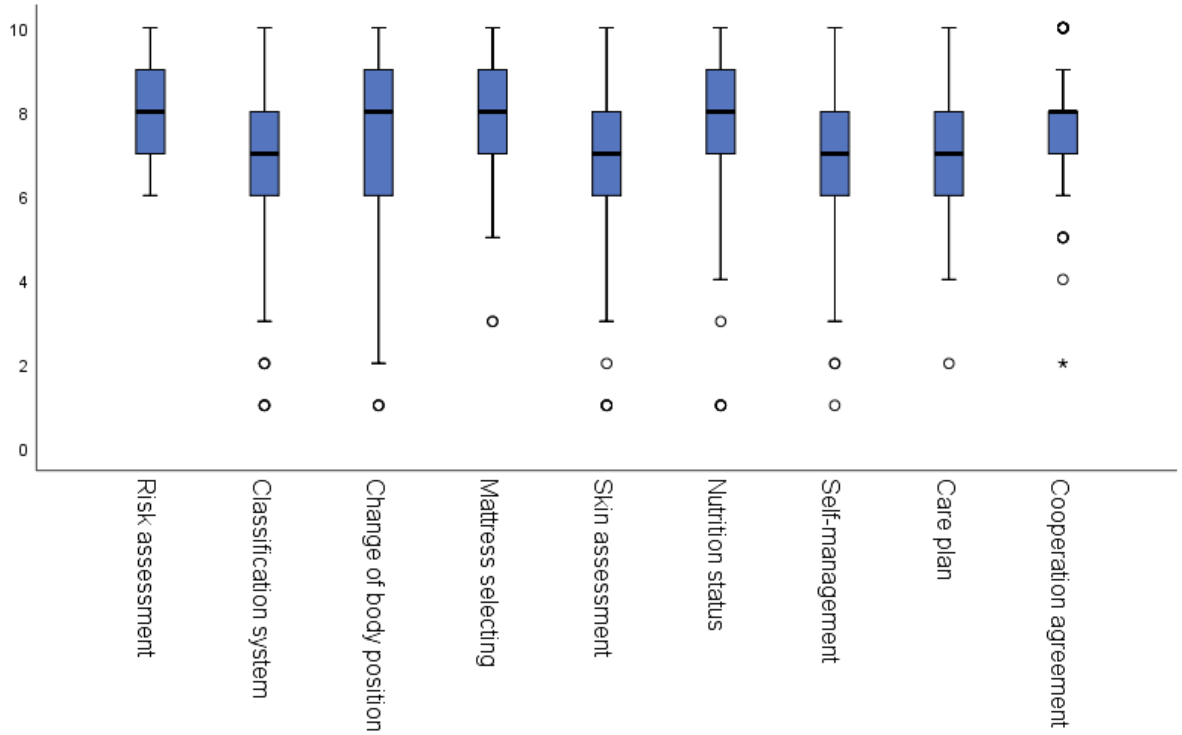

Figure 1: Boxplots of the recommendations of the pressure ulcer guideline