Behavior of nurses regarding fall prevention: How it is and how it should be.

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Abstract

Background/Aim: In-hospital falls among older patients are serious adverse events, which lead to a reduced quality of life. Therefore, preventing them is very important. This study targets two aims. The first aim is to specify the target behavior and the second aim is to identify the current behavior and perspectives of Dutch hospital nurses regarding fall prevention among older hospitalized patients. The target behavior relates to the behavior that is most promising to change. The COM-B (Capability, Opportunity, Motivation-Behavior) model was used to identify the behavior of nurses.

Methods: The study used a generic qualitative approach. For specification of target behavior, a two-round Delphi with experts in Geriatrics was used. Experts answered open and closed questions by e-mail. The method of Lynn was used to analyze the Delphi data. Then, for identification of current behavior and perspectives, focus groups with hospital nurses were executed. Thematic analyses was used to analyze the focus groups. Participants of the Delphi and the focus groups came out of ten teaching hospitals in the Netherlands.

Results: The Delphi included 13 experts and in their opinion ‘after-care’, ‘estimating fall risk’ and ‘providing information’ are the most relevant target behaviors. The five focus groups included 26 nurses. Nurses experience a lack of knowledge and important preconditions such as mobilization tools and find it difficult to include patients’ perspectives in their fall prevention care.

Implications: Future research should use the results of this study to develop a multicomponent fall prevention program. Furthermore, nurses and managers need to use the results of this study to create awareness and provide for preconditions to prevent in-hospital falls and improve quality of patient care.

Key words: Fall prevention, older patients, Behavior change, COM-B model.

Samenvatting

Achtergrond en doel: Oudere patiënten in het ziekenhuis hebben een verhoogd risico op een valincident. Het goed inzetten van valpreventieve maatregelen vraagt om gedragsverandering bij verpleegkundigen, maar daarvoor dient eerst het huidige gedrag en het doelgedrag van verpleegkundigen met betrekking tot valpreventie onderzocht te worden. Het doelgedrag refereert naar het gedrag dat het meest kansrijk is om te veranderen. Er zijn verschillende modellen om gedrag te onderzoeken, waaronder het COM-B (Capability, Opportunity, Motivation-Behavior) model. Deze studie gebruikt de COM-B als theoretische basis.

Methode: Dit is een kwalitatieve studie. Een Delphi, bestaande uit twee rondes met experts in de Geriatrie werd gebruikt. Experts moesten open en gesloten vragen beantwoorden via e-mail om het doelgedrag te definiëren en specificeren. De methode van Lynn werd gebruikt om de data te analyseren. Focusgroepen met verpleegkundigen werden gehouden om het huidige gedrag en perspectieven van verpleegkundigen te identificeren aan de hand van het COM-B model. De thematische analyse werd gebruikt om de data te analyseren.

Resultaten: Aan de twee Delphi rondes hebben 13 experts meegedaan. Zij hebben aangegeven dat *nazorg*, *inschatten valrisico* en *informatie verstrekken* de belangrijkste doelgedragingen zijn. In totaal vonden er vijf focusgroepen met 26 verpleegkundigen plaats. Verpleegkundigen ervaren een kennistekort, zij worden onvoldoende gefaciliteerd in belangrijke randvoorwaarden en vinden het moeilijk om het patiëntenperspectief te includeren in hun interventies.

Aanbevelingen: Toekomstige studies kunnen de resultaten van deze studie gebruiken om een valpreventie programma te ontwikkelen. Daarnaast kunnen managers en verpleegkundigen de resultaten gebruiken om bewustzijn te creëren over belangrijke randvoorwaarden die nodig zijn om valincidenten te voorkomen en ervoor te zorgen dat verpleegkundigen goede patiëntgerichte zorg kunnen leveren.

Sleutelwoorden: valpreventie, gedrag verpleegkundigen, COM-B model, oudere patiënten.

Introduction

Worldwide, people are aging.[1] Hospitals are a potential dangerous place for these patients, because of a higher risk for complications, such as falls.[2,3] A fall can be defined as an unexpected descent from an upright, sitting or horizontal position.[4] There are several risk factors for falls such as impaired balance and cognitive impairment.[5] Falls can lead to injury, functional decline and prolonged hospital stays.[6] Moreover, older people who experience falls report increased anxiety and reduced quality of life.[7] International incidence numbers of in-hospital falls vary between 2%-15% and costs resulting from falls alone have been reported between 0.85%-1.5% of the total healthcare expenses within the United States, Australia, European Union and United Kingdom.[8,9] Because of the serious consequences of in-hospital falls, preventing them is very important.

Several studies describe barriers for successful fall prevention programs, relating to; patients, nurses and context[10-15]. The first barrier is that patients' perspectives are often not included in programs, resulting in a possible mismatch between perspectives of healthcare professionals and patients. Often, patients want to be active participants in their fall prevention plan, and when preferences are ignored, they may feel their autonomy threatened.[14,15] Including these preferences into tailored programs may reduce the risk of falls.[16] The second barrier relates to nurses. Fall prevention programs are universally multidisciplinary, but nursing centered. Nurses experience several barriers for successful fall prevention programs, such as lack of knowledge, access to equipment and education of staff. This is consistent with a recent study that showed that education often receives little attention in the development of multicomponent interventions.[17] The possible lack of caring attitude among nurses is also suggested as a barrier.[11] A study by Liu presented a more negative attitude of nurses toward older patients.[18] Nurses experience older people often as a burden and frustrating, especially when they are confused.[18] Cultivating and sustaining a caring attitude among nurses is often ignored as an intervention strategy and can be one of the causes of patients' falls.[11,18] Some barriers relate to organizational factors. Earlier studies have shown that the focus in developing programs need to be on context, otherwise intervention programs often fail.[19] Previous research stated that strong leadership and environmental support were successful strategies for implementing fall prevention programs with sustained reduction in fall-related injuries.[20]

Implementing changes requires behavior change. The COM-B mode (Capability, Opportunity, Motivation-Behavior) assists with designing interventions to change behavior. COM-B posits behavior as the result of an interaction between three components: Capability, which can be psychological (knowledge) or physical (skills); Opportunity can be social

(societal influences) or physical (environment); motivation can be automatic (emotion) or reflective (beliefs, intentions).[21,22] COM-B can help to identify barriers and facilitators of behaviour change.

In conclusion, fall prevention programs need to target institutions' structural and attitudinal needs and the barriers and facilitators of behavior change.[11] Programs should target structure and process of care and two educational goals: a) promotion of nurses' professional knowledge and skills and b) improving nurses' attitudes.[11] It is unknown which strategies should be combined in such a program and the potential effects it has on fall prevention. Moreover, before such a program can be developed first the behavior a program is aiming to change needs to be specified (target behavior). This is the behavior that has a high impact on the outcome, is easy to change and measure and has a high impact on other related behaviors.[21,22] Also, the current behavior and perspectives of nurses regarding fall prevention needs to be identified.

This study targets two aims. The first aim is to specify the target behavior and the second aim is to identify the current behavior and perspectives of Dutch hospital nurses regarding fall prevention among older hospitalized patients.

2. Methods

2.1 Design and data collection

The study used a generic qualitative approach. For specification of target behavior, a two-round Delphi with experts in Geriatrics was used. Then, for identification of current behavior and perspectives, focus groups with hospital nurses were executed. This study is embedded in ten tertiary teaching hospitals in the Netherlands, collaborated in the RENursE Consortium (Research, Education and Nursing, regarding Elderly).[23] RENursE stimulates broad research with the aim to improve nursing care for older hospitalized patients.

2.2 Specification of target behavior

A two-round Delphi (Figure 1), using opinions of experts, was used to specify the target behavior. Eligible experts were medical doctors, nurse practitioners, nurse specialists and physiotherapists with further education in Geriatrics. In the first Delphi round experts were presented a definition of the behavior of nurses to prevent falls based on the Dutch guideline for fall prevention among older hospitalized patients.[24] Experts were asked to determine the relevance and completeness of the definition. Next, experts were asked to determine which behaviors were most relevant for changing the behavior of nurses from a list of seven behaviors described in the Dutch guideline. Relevance was determined by answering four

questions per behavior (Table 1), relating to impact on the outcome, ease of change and measurement and impact on other related behaviors.[21,22] As a result of the first round a top three of target behaviors was derived, based on the I-CVI scores (see analysis). In the second round experts were provided an overview of the seven behaviors including the scores of the first round and were asked to give feedback and confirm the relevance of the top three of target behaviors.

2.2.1 Procedures of Delphi

Each RENursE hospital has a nurse researcher (NR). The NR approached one or two experts in Geriatrics out of their own hospital by email including the information letter of the study. This way, 10 to 20 experts were included, enough to meet the minimum of inclusion to use the method of Lynn (see analysis). Included experts gave written consent and were contacted by the main researcher (LJH) with further information about the study procedures and instructions. Further contact was by email, including sending and receiving questionnaires in the Delphi rounds.

2.2.2 Analyses of Delphi

The method of Lynn was used to reach consensus among experts.[25] Lynn is a quantification of a qualitative process, meaning that the item scores are interpretative and meaning or conclusions are based on context and interpretation.[25-27] In each Delphi round experts answered open and closed questions. Closed questions were scored on a four-point Likert scale: *irrelevant, mainly not-relevant, mainly relevant, highly relevant.*

For closed questions an item-content validity index (I-CVI) was determined. The I-CVI refers to the number of experts who defined the content relevant. All scores of the experts were divided in to relevant (mainly relevant/ highly relevant = 1) and not relevant (irrelevant/ mainly not-relevant = 0). Than the I-CVI was calculated: sum of the scores of the item / number of experts. An I-CVI score of 0.78 was considered relevant. The method of Lynn requires a minimum of five participants to give the score-items a marge of one expert who scores insufficient.[25-27] Based on the I-CVI score the main researcher and the research team interpreted the data to find meaning and draw conclusions.

2.3 Identification of current behavior and perspectives

Semi-structured focus groups with nurses were used to identify their current behavior and perspectives regarding fall prevention. Eligible nurses needed to work at a ward where older patients were admitted. Nursing students were excluded because of possible limited

experience in caring of older adults. The aim was to reach a-priori thematic saturation based on the COM-B.[22] Nurses were asked about capability (knowledge and skills), opportunity (social and environmental influences) and motivation (emotional and reflective) regarding fall prevention.[22] Also a patient case was presented during the focus groups to identify the current behavior of nurses. Based on the patient case nurses shared step-by-step the interventions they used. At last nurses were asked which behaviors of the Dutch guideline of fall prevention should be included in a fall prevention program.[24] This way, the opinions of experts and nurses were compared.

2.3.1 Procedures of focus groups

All NRs of RENursE were asked to organize a focus group in their own hospital including six to eight nurses to ensure a variety of perspectives.[28] All nurses gave written consent. The main (LJH) and second researcher (MvdW) travelled to the hospitals for the focus groups. LJH was the interviewer, MvdW made fieldnotes, drew diagrams with the names of participants and helped with practical matters. All focus groups were audio-recorded and transcribed.

2.3.2. Analyses of focus groups

A thematic analysis according to Braun and Clarke consisting of six phases was used to analyze the data of the focus groups.[29] First the main researcher familiarized herself with the data by transcribing all the focus group material and reading the transcribed material. The main and second researcher analyzed the transcripts independently. The initial codes formed a list of ideas about the data (open codes) and were then organized in broader categories based on repeated patterns (axial codes).[30] The COM-B was kept in mind, but the open and axial codes were primarily data driven. Then the open and axial codes were combined with the pre-defined components of the COM-B (Capability, Opportunity, Motivation-Behavior).

2.4. Trustworthiness

Trustworthiness was achieved by several strategies.[28] Data triangulation was used by including multiple data sources; nurses and experts, which increased the validity. Experts and nurses were included from ten different hospitals in different areas of the Netherlands, resulting in a maximum heterogenic sample. Investigator triangulation increased the credibility of the data. A second researcher independently analyzed the data of the focus groups and results were discussed within the Research Team to foster reflexivity. This way any biases of the main researcher were discussed and reflected on. Theory and methodological triangulation was reached by including method of Lynn and COM-B as

theories.[28] Also, during the focus groups the five stages for focus group researchers were used to establish ground rules and consider ethical issues.[31] At last, the consolidated criteria for reporting qualitative research were used to write this article[32] and the procedures of this study were reviewed and approved by the medical board of Brabant (N.18.146). The main researcher is a female nurse, specialized in Geriatrics and works in one of the RENursE hospitals. For her master thesis in Nursing Science she completed this study.

3. Results

3.1. Specification of target behavior

The Delphi included 13 experts out of six hospitals. Data was collected from December 2018-Februari 2019. Experts consisted of nurses (n=5), physiotherapist (n=1), Medical Doctors (n=4) and Nurse Specialists (n=3). The first round was completed by 11 experts, the second round by 10 experts. Due to work or private related issues two medical doctors did not complete both rounds and one Medical Doctor did not complete the second round.

All experts shared the opinion that the definition according to national guidelines was relevant (ICVI=1). Qualitative feedback of the experts resulted in two minor adjustments, resulting in the following definition: *Improvement of applying fall prevention and repressive interventions by nurses, working in hospitals, according to the national guideline; "prevention of falls regarding elderly people".*

Experts find 'after-care', 'estimating fall risk' and 'providing information' the most promising target behaviors. See table 1 (respectively a mean I-CVI of 0.82, 0.80 and 0.79). They estimate the impact as highly relevant (respectively an I-CVI of 1.0, 0.91 and 0.91) to the desired outcome and think that the target behaviors have a relevant impact on other related behaviors (I-CVI of 0.82-0.73-0.82). In experts opinions estimating fall risk is a relevant target behavior as fall prevention starts with a thorough assessment, carried out by nurses when patients are admitted in a hospital. Providing the right knowledge to patients and their families is essential in preventing falls. Nurses should be able to provide this information and increase awareness among patients and families. After-care is important according to experts as hospitals should have an open registration and dialogue culture to stimulate learning opportunities. But is also important for patients as they may experience increased anxiety or other negative outcomes.

Expert (physiotherapist): "When a fall has occurred, the right after care needs to take place to prevent anxiety for falls, functional decline and prolonged hospital stay."

3.2. Identification of current behavior and perspectives.

Nurses' behavior and perspectives regarding fall prevention were included by focus groups in five different rural and urban hospitals in the Netherlands. In total 26 nurses were included. Two focus groups included less than six nurses, because of last minute cancellation of the participant. The other five hospitals did not succeed in organizing a focus group due to organizational limitations. All focus groups were held in January 2019 and lasted between 55 and 75 minutes. The average years of working experience was 12 (2-30) years. Nurses worked on different wards; surgeon ward (n=7), internal medicine ward (n=15), combination ward (n=1) and acute care ward (n=3).

A priori thematic saturation was reached as no new codes emerged from the data. No codes derived from the data that could not be combined with the pre-defined themes of the COM-B. The results are described per element of the COM-B. For capability, opportunity and motivation diagrams were made (Figure 2, 3 and 4). Themes are supported by quotes with number of focus group (F), number of participant (R) and years of working experience (Y).

3.2.1 Capability (knowledge, skills).

Nurses report limited knowledge regarding fall prevention among younger colleagues, but also among medical doctors, patients and families. In nurses' perspectives limited knowledge is a barrier for applying fall prevention interventions according to national guidelines.

F4R1Y11: 'It helps when there is an adequate nursing team. Younger nurses, who finished their education two months ago, have limited expertise.' '…..Patients and family think falls are related to getting older and is considered normal.'

Although Nurses report limited knowledge of others, they themselves also have unconsciously a lack of knowledge. They have limited knowledge about the presence of local and national guidelines regarding fall prevention. Several nurses did not know if there is patient information material available in their hospital.

F3R3Y2: '….If there is a local guideline, I think so. I have to say very honestly that I do not know it, we do not use it….' '….information leaflets about fall prevention? I do not know. F3R3Y23: 'No, me neither.'

Moreover, nurses think that falls among older patients who are confused is not preventable.

F2R3Y9: 'When we evaluate fall incidents, most of the time we conclude that we could have prevented it, not always though, because there are also confused older people. You can apply interventions and they still fall out of bed.'

Finally, according to nurses fall prevention is of low priority in most hospitals and is too little part of daily nursing practice.

F2R3Y9: 'It really is underexposed. The need is not recognized. There is insufficient awareness of the need that we should do a risk assessment at admission and apply preventive interventions.'

3.2.2. Opportunity (social, environmental influences).

Nurses think that hospitals are not prepared for the increase of older people. They describe a lack of mobilization tools, there are slippery bathroom floors, wards with no toilet rails, or wrong placed grab bars and support rails.

F2R5Y11: "……Toilets are not high enough, toilets are too small for save mobilization, there are no support rails. Things like that…."

Processes are often limited to single wards instead of hospital wide and therefore conditions are different. Technology is sometimes supportive and sometimes obstructive. They describe a lack of communication tools or a diversity of electronic patients files.

F2R4Y8: "….On the Geriatric ward, we use sensors, at Psychiatric ward they have extra low beds for fall prevention, at Neurology they have fall-out fall prevention mats. I think that's strange."

3.3.3. Motivation (emotions, beliefs).

Nurses feel motivated and responsible to prevent falls as they do not want their patient to experience a fall. When nurses take control to change conditions, their efforts lead to few results because of managerial decision processes. Which effects their motivation negatively. Furthermore, nurses experience stress because of workload and limited staff occupation. Both influence their motivation in a negative way.

F5R3Y1: "Motivation comes from two ways, you do not want your patient to get injured, but when a patients falls, it causes a lot of hassle…."

3.3.4. Behaviour

Based on a patient case the current behaviour of nurses was identified. Nurses experience a lack of completion of the nursing assessment when patients are admitted in the evening or at night. As a result, the estimation of the fall risk is sometimes not completed. A multifactorial fall risk assessment is, according to nurses, currently not a part of fall prevention care in their hospitals. Fall prevention interventions are most of the time related to optimizing vision and hearing abilities of patients and providing tools for mobilization. Nurses experience limited multidisciplinary collaboration and therefore a lack of multidisciplinary interventions relating to mobilization and nutrition programs. And when nurses are anxious their patient will fall, they often use physical restraint interventions. Nurses find it very difficult to involve older patients in their care program. Some nurses experience patients and families as a barrier because they do not listen and follow instructions. Nurses think they do not have the right knowledge and tools to provide sufficient information to them. Furthermore, nurses experience a limited registration culture. Some hospitals do not register and evaluate fall incidents on a regular base.

F3R3Y23: "Registration of falls depend on degree of injury." F3R1Y18: 'It depends on who works, whether or not it is registered."

At last nurses were asked which of the behaviors of the Dutch guideline were most promising to change. Answers were divers, but in most nurses' opinions 'providing information', 'fall prevention' and 'multifactorial fall risk assessment' are the most promising target behaviours. Arguments for these target behaviors were broad, but mainly related to the knowledge deficits nurses experience.

Discussion and conclusion

This study specified the target behavior and identified the current behavior and perspectives of nurses regarding fall prevention. In experts' opinions 'after-care', 'estimating fall risk' and 'providing information' are the most promising target behaviours. However, in nurses' opinions the target behaviors should be; 'providing information', 'fall prevention' and 'multifactorial fall risk assessment'. Thus, there is a partial discrepancy in the opinions of the experts and nurses. This raises the question which target behaviors should be included in a multifaceted fall prevention program. Considering the knowledge and experience of the experts, their target behaviors should minimally be included. However, as mentioned before fall prevention programs are nursing centered.[11] Therefore, education regarding fall prevention should match the different needs and tailored learning strategies used by

nurses.[33,34] Education about other behaviors can be added to the program as a way for nurses to tailor the intervention to their needs.

Several results regarding the current behavior and perspectives of nurses should be discussed further. First, nurses report knowledge deficits of others, but also themselves have a lack of knowledge. The lack of knowledge regarding local and national guidelines and the availability of patient information is alarming. Nursing care increasingly involves older patients and nurses' knowledge is associated with the quality of care received by older patients.[18,35] Thus, a multifaceted fall prevention program should also include strategies to create awareness about the knowledge deficits nurses have themselves. A second notable result is the lack of important preconditions, such as the availability of mobilization tools. A result that is consistent with previous research about experienced barriers by nurses for successful fall prevention programs.[13] Nurses take limited control to change those conditions, but when they do, their efforts lead to few results because of managerial decision processes. Therefore, managers need to be involved in programs to facilitate the opportunity for nurses to deliver the patient-centered care.[36] Furthermore, strategies need to be included about leadership behaviour to positively influence organizational outcomes, nursing practice and thereby improve quality of care for patients.[37,38] A study of Fonda et al. stated that strong leadership and environmental support were successful strategies for implementing fall prevention programs.[20] A third notable result is that nurses do not include patients' perspectives in their care. This result is consistent with a recent review about patient participation in nursing care.[39] Patients and nurses desire, perceive or enact patient participation passively. Information sharing was identified as an activity that promotes patient participation, which is consistent with the opinions of experts, who find 'providing information' one of the most important target behaviors. Previous research has shown that not including patients' perspectives is an important barrier for successful fall prevention programs.[10,15,40] Thus, sharing information should be included as an important strategy to stimulate patient participation.

This study included several strategies to maximize trustworthiness, such as data-, research- and methodology triangulation. There were also some limitations. Often, Delphi studies consist of more rounds than two. Due to time limitations it was not possible to include more rounds. This limited the possibility for more in-depth questions. However, saturation was reached as experts reached consensus (ICVI=1). Due to work load on wards some nurses were not able to attend the focus groups and five hospitals did not succeed in organizing a focus group, this limits the generalizability of the results. However, saturation was reached and the diversity in context led to rich and interesting data.

The COM-B model helped to understand the complexity of the behavior of nurses. COM-B lies at the center of the Behaviour Change Wheel (BCW).[21,22] The BCW facilitates the selection of intervention strategies for each COM-B component. Future research should use the results of this study to select BCW interventions to develop a multicomponent fall prevention program. Furthermore, nurses and managers need to use the results of this study to create awareness and provide for preconditions to prevent in-hospital falls.

In conclusion, this study answered two questions. First, according to experts, the most promising target behaviours are ‘after-care’, ‘estimating fall risk’ and ‘providing information’ and should be included in a multifaceted fall prevention program. Secondly, the current behavior and perspectives of nurses were identified. Nurses experience a lack of knowledge and a lack of important preconditions which influences their motivation in a negative way. Furthermore, nurses find it difficult to include patients’ perspectives in their care. The behavior of nurses is not according to the Dutch national guideline of fall prevention. The BCW can be used to identify further strategies to change that behavior.

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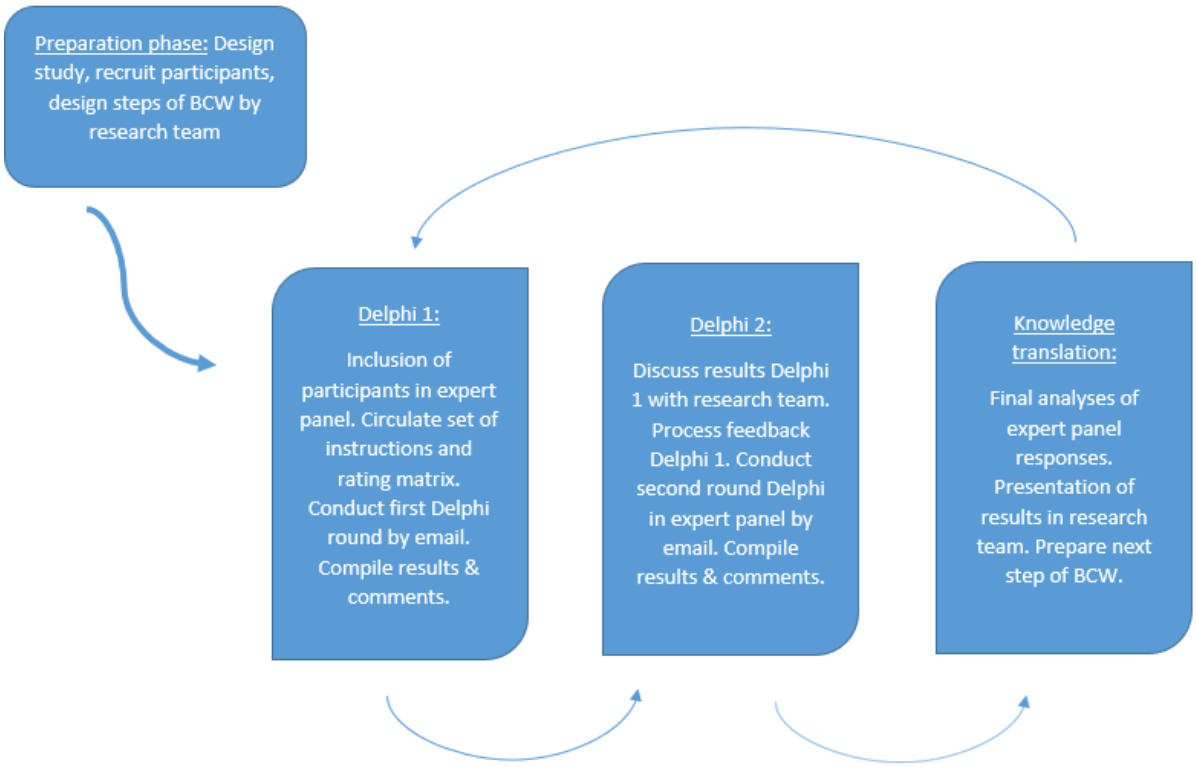

Figure 1: Two-round Delphi

Table 1: Relevance of target behaviours based on opinions of experts in Geriatrics.

Target behaviours	How much impact will changing the behaviour have on the desired outcome?	How likely is it that the behaviour can be changed?	How likely is it that the behaviour will have an impact on other, related behaviours?	How easy is it to measure the behaviour?	Total ICVI score (*m*)*
Estimating fall risk	0.91	0.82	0.73	0.73	0.80
Mult. risk assessment	0.82	0.82	0.64	0.45	0.68
fall prevention	0.82	0.82	0.73	0.50	0.72
compliance of elderly patients	0.45	0.36	0.64	0.18	0.41
organization of care	0.82	0.82	0.73	0.36	0.68
providing information	0.91	0.91	0.82	0.5	0.79
after-care	1.0	0.64	0.82	0.82	0.82

ICVI scores based on four-point Likert scale. Mainly relevant or highly relevant= 1, irrelevant or mainly not relevant= 0.
** Total ICVI score based on ICVI scores of four questions per target behaviour. (m)= mean.*

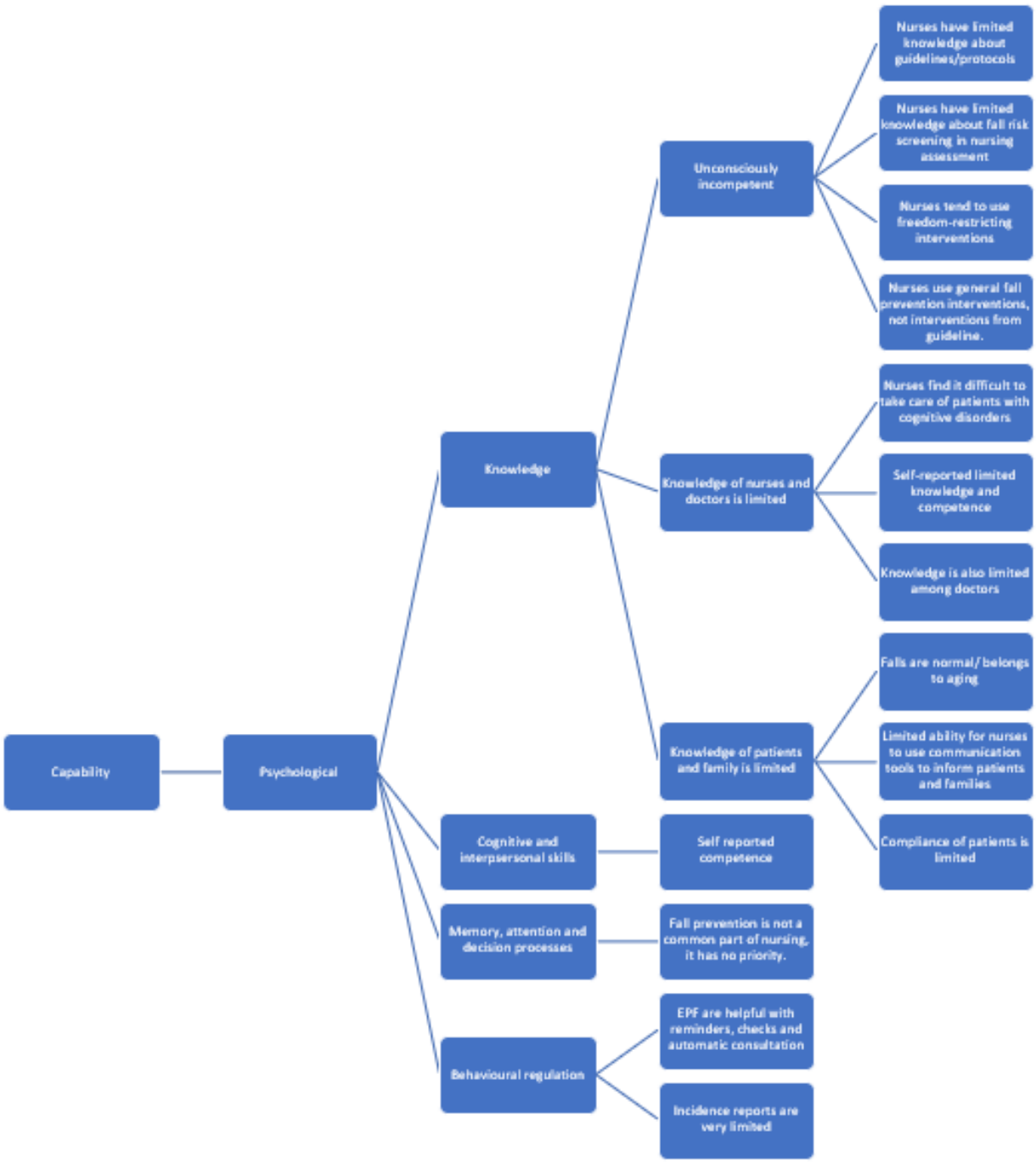

Figure 2: Diagram of data focus groups; Capability

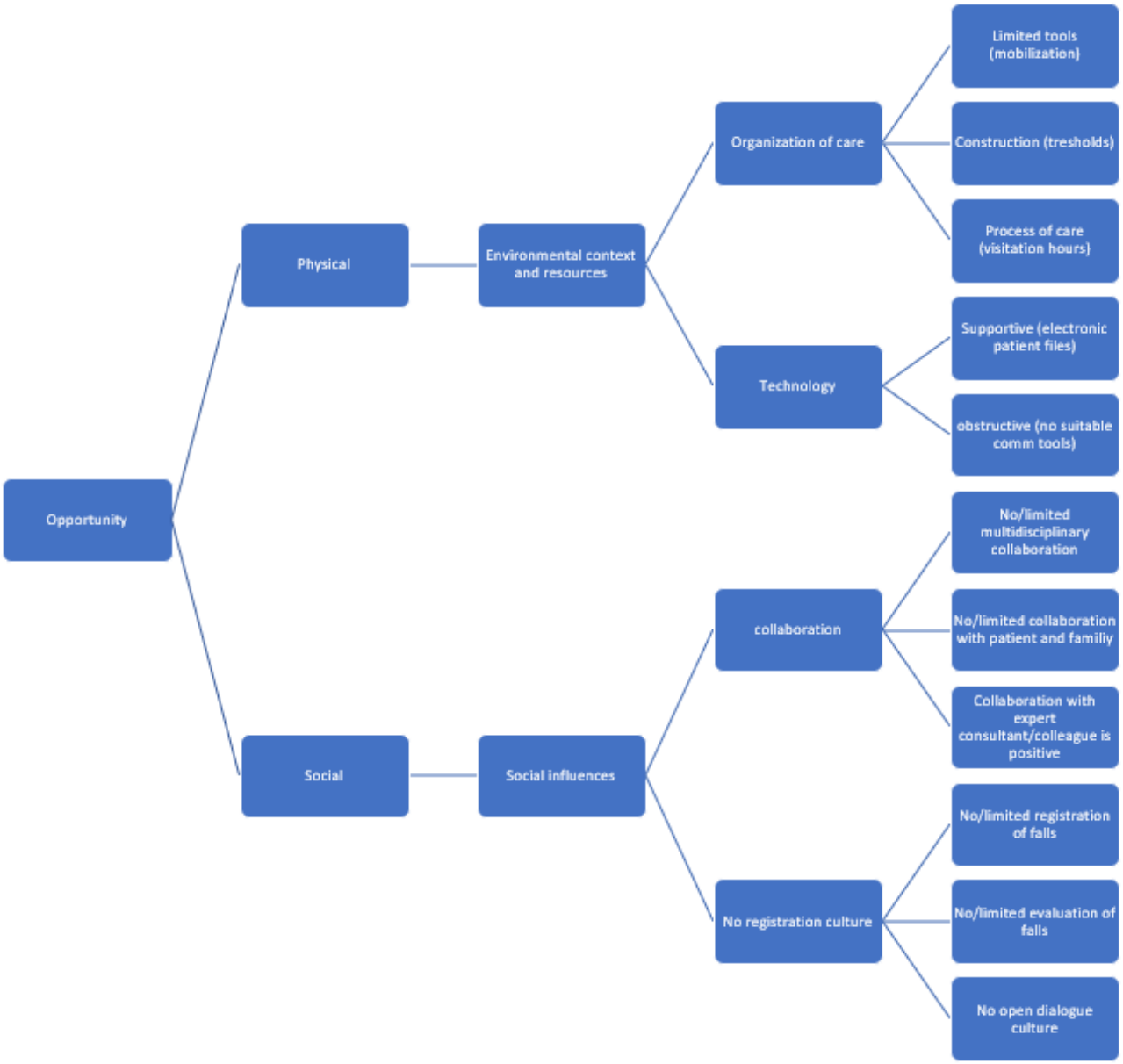

Figure 3: Diagram of data focus groups: Opportunity.

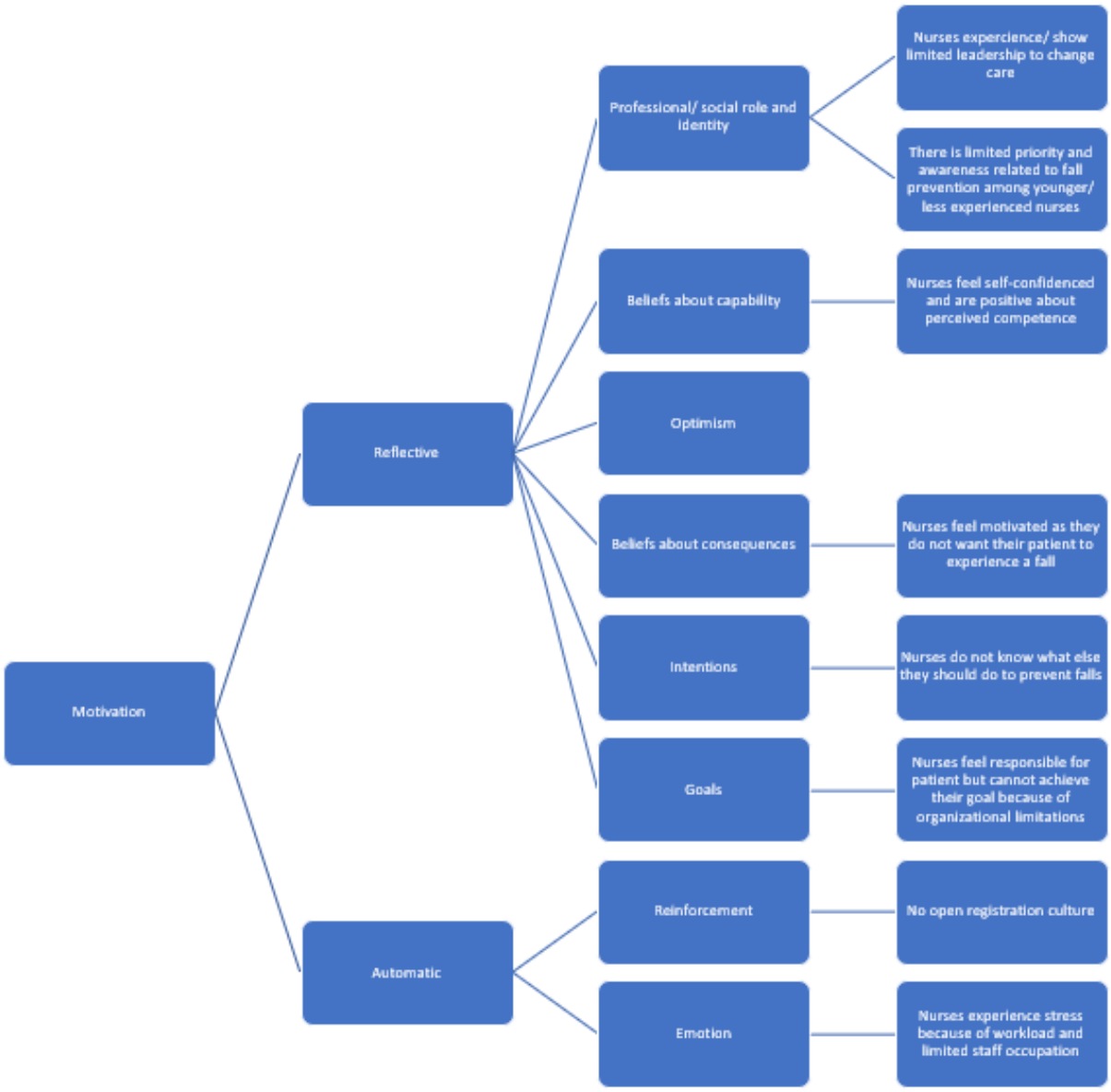

Figure 4: Diagram of data focus groups: Motivation.