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# Facilitating the use of personal safety alerting device with older adults: The views, experiences and roles of relatives and health care professionals

Friederike JS Thilo, PhD, RN<sup>a,b,\*</sup>, Sabine Hahn, PhD, RN<sup>a</sup>, Ruud JG Halfens, PhD<sup>b</sup>, Birgit Heckemann, PhD, RN<sup>a,c,e</sup>, Jos MGA Schols, MD, PhD<sup>b,d</sup>

<sup>a</sup> Applied Research & Development in Nursing, Department of Health Professions, Bern University of Applied Sciences, Bern, Switzerland

<sup>b</sup> School CAPHRI, Department of Health Services Research, Maastricht University, Maastricht, The Netherlands

<sup>c</sup> Institute of Health and Care Sciences, Sahlgrenska Academy, Gothenburg University, Gothenburg, Sweden

<sup>d</sup> School CAPHRI, Department of Family Medicine, Maastricht University, Maastricht, The Netherlands

<sup>e</sup> Department of Anaesthesiology, Surgery and Intensive Care, Sahlgrenska University Hospital, Gothenburg, Sweden



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## ABSTRACT

To explore relatives', community nurses' and general practitioners' perspectives and experiences in promoting Personal Safety Alerting Device (PSAD) use among community-dwelling older adults, we applied a qualitative study design. Altogether 15 focus groups and 11 semi-structured interviews were conducted. Data-analysis followed the Qualitative Analysis Guide of Leuven. PSAD use was considered to be complex. Relatives and health care professionals are involved in a negotiation process comprising three phases: A) waiting for a critical event in the older adult's everyday life; B) introducing the idea of a PSAD; C) deciding on and supporting PSAD use. In conclusion, the actors involved in PSAD use should be aware of the negotiation process, which is complex, dynamic, iterative and needs time. While nurses play a crucial role, they lack sufficient knowledge for comprehensive PSAD counselling. The negotiation process could serve as an example for other technologies in the context of aging in place.

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## Introduction

Aging societies are a common issue on political and health care agendas across the globe.<sup>1</sup> Currently, one focus is on 'aging in place' which promotes the wellbeing of aging societies and refers to enabling older adults to live as independent, safe and socially integrated persons in their accustomed home in the community.<sup>2</sup> A majority of older adults prefer aging in place to institutionalized living.<sup>3,4</sup> Furthermore, international estimates indicate that independent living costs can be lower than the cost of institutional living.<sup>5</sup>

Assistive technologies may significantly contribute to successful aging in place.<sup>6</sup> They may assist older adults in issues of mobility, physical and mental health, safety, social connectedness as well as in daily activities.<sup>6,7</sup> The current non-use of assistive technologies in community-dwelling older adults is a major concern,<sup>8,9</sup> as it can ensure safe aging in place. Particularly emergency situations like falls

illustrate how the use of technology can lead to increasing safety and reducing harmful consequences in older adults. Between 25% - 35% of persons aged 65 and older experience at least one fall per year.<sup>10</sup> Being unable to get up after a fall and thus enduring a 'long lie', defined as lying on the floor/ground for longer than one hour,<sup>11</sup> can compromise the health and well-being of older adults, and can also lead to long-term care admission.<sup>12,13</sup> Therefore, Personal Safety Alerting Devices (PSADs) could be considered a pivotal technology for aging in place, to facilitate communication<sup>7</sup> and to get rapid assistance, e.g. after a fall.<sup>14,15</sup>

Despite well-documented advantages, community-dwelling older adults are often reluctant to use PSADs.<sup>16,17</sup> Research investigating the perspective of older adults has revealed that their technology acceptance can be positively influenced by relatives and health professionals.<sup>18–20</sup> Despite this, research has focused on older adults' acceptance of different types of technologies for aging in place<sup>9,14</sup> and from a nursing perspective,<sup>21</sup> but not on the antecedents of PSAD use or non-use from a multi perspective approach. However, the perspectives of relatives, community nurses and general practitioners (GPs) regarding PSAD use and non-use in community-dwelling older adults is crucial; they are actively involved in aging in place and close

\* Corresponding author.

E-mail addresses: [friederike.thilo@bfh.ch](mailto:friederike.thilo@bfh.ch) (F.J. Thilo), [sabine.hahn@bfh.ch](mailto:sabine.hahn@bfh.ch) (S. Hahn), [birgit.heckemann@gu.se](mailto:birgit.heckemann@gu.se) (B. Heckemann), [jos.schols@maastrichtuniversity.nl](mailto:jos.schols@maastrichtuniversity.nl) (J.M. Schols).

to older adults, supporting their safety and serving as contact persons in case of an emergency when a PSAD is activated. In addition, recent research suggests that understanding technology acceptance requires knowledge about all those involved in its use.<sup>15,22,23</sup> It is pivotal to answer the ‘why, when and how’ of technology use<sup>22,24</sup> instead of considering assistive technologies as black boxes that can be integrated in daily life without modifying practices or routines.<sup>15</sup> Exploring the perspectives of relatives, community nurses and GPs enables us to understand their experiences, perceptions and involvement in PSAD use or non-use in community-dwelling older adults. In this research, the following research questions were addressed:

1. What are the reasons for PSAD use or non-use among community-dwelling older adults according to relatives, community nurses and GPs?
2. In what situations are PSADs used or not used by community-dwelling older adults according to relatives, community nurses and GPs?
3. What is the involvement of relatives, community nurses and GPs in the use or non-use of PSADs?

## Methods

A qualitative descriptive research design was applied,<sup>25</sup> using focus groups (relatives and community nurses) and semi-structured interviews (general practitioners),<sup>26</sup> to uncover and explore rationales for behavior and the involvement of relatives, community nurses and GPs related to PSAD use and non-use among community-dwelling older adults.

### Sampling and recruitment

Using a combined purposeful and snowball sampling strategy, relatives, community nurses and GPs who care for community-dwelling older adults in two Swiss cantons were invited to participate in this study. The inclusion criteria were: 1) relatives: daughter / son / spouse of a community-dwelling person aged 70 or older; 2) community nurses (RNs): working for a community care service provider, with at least one-year professional experience in caring for older adults; 3) GPs: working with one-year minimum professional experience caring for older adults. The recruitment strategies are displayed in Table 1.

### Data collection

Data were collected between February and December 2017: Six focus groups with relatives (4–7 participants each) with an average duration of 108 minutes (min–max 87–120), nine focus groups with community nurses (3–5 participants each) with an average duration of 93 minutes (min–max 80–108) and eleven interviews with GPs with an average duration of 58 minutes (min–max 50–85) were conducted.

After the focus groups/interviews, the participants were asked to complete a short questionnaire on socio-demographics and their experience with PSADs (use).

The site of data collection was at the Institute of Nursing Science (relatives), at the organization of the community nurses and at the medical practice. All focus groups and interviews were audio-recorded.

### Focus group and semi-structured interview

All focus groups were moderated, and all interviews conducted by the first author, who is experienced in qualitative interviewing and has a professional background in nursing. The focus groups with relatives and two with community nurses were attended by a research assistant for administrative tasks and support with the PSAD presentation. A semi-structured interview-guide with open-ended questions (Table 2) developed by the research team, based on the literature presented in the background and the researchers' expertise, was utilized to moderate the focus groups and conduct the interviews.

In the second part of the focus group and interview ten PSADs were presented to the participants to: (i) provide the same information on PSAD diversity, use and function, (ii) to stimulate the discussion based on real devices and (iii) to better understand opportunities and challenges of PSADs and technical aspects possibly influencing use and non-use.

The first author reflected on each focus group/interview and took written notes regarding the course of the discussion/s and recurrent/conflicting/surprising/new themes in order to maintain a reflective stance and to incorporate insights into the subsequent data collection.

### Data analysis

All focus groups and interviews (= 26 cases) were fully transcribed verbatim, using the software program f4®. The analysis was an iterative team process. The research team included members with different professional backgrounds, i.e. nursing, gerontology and psychology. The researchers met regularly to discuss the analysis across the different coding cycles. Any discrepancies were discussed until consensus was reached.

The data were analyzed following the ten stages of the Qualitative Analysis Guide of Leuven (QUAGOL).<sup>27</sup> QUAGOL comprises two main processes, a Preparation of Coding Process and the Actual Coding Process. Each process consists of five stages. However, although the processes are described as linear in the literature, the actual analysis is an iterative process, where the different stages are not necessarily distinct, but may overlap. The QUAGOL framework enabled the researchers to become deeply familiar with the data prior to commencing any systematic coding. It also encouraged the researchers to move stepwise from the concrete interview data towards an increasing level of abstraction during the course of the analysis.

Initially, the researchers familiarized themselves with the data thorough (re-) reading of the interviews (stage 1). Following the

**Table 1**  
Recruitment strategies.

Recruitment strategies – potential participants		
Relatives	Community Nurses	General Practitioners
Study advertising via:		
Flyer (n = 770) distribution: <ul style="list-style-type: none"> <li>□ Public institutions, e.g. for the education of health professionals</li> <li>□ Faculty members (not part of the research team, nor in project collaboration)</li> <li>□ Physiotherapists</li> <li>□ Fitness centers</li> </ul>	<ul style="list-style-type: none"> <li>□ Short article in specialized national magazine</li> </ul> Flyer distribution: <ul style="list-style-type: none"> <li>□ 42 community care service providers randomly selected from public list and nurse manager contacted (email and telephone)</li> </ul>	<ul style="list-style-type: none"> <li>□ Professional association of family physicians informed members via email</li> <li>□ GPs from one city and its environs contacted via telephone and email (pragmatic choice)</li> </ul>

**Table 2**  
Semi-structured interview-guide for focus groups and interviews.

First part	Specified questions for:
	<p>Relatives</p> <ul style="list-style-type: none"> <li>□ Tell me about your experience with the topic of falls. (introductory question)</li> <li>□ Tell me about how you are dealing with the following situations: your mother/ father/ husband/ wife a) needs, b) is using, c) should in your opinion use a PSAD?</li> <li>□ Tell me about your experience regarding PSAD use and non-use.</li> </ul> <p>Community nurses</p> <ul style="list-style-type: none"> <li>□ Tell me about your activities and tasks in the context of falls. (introductory question)</li> <li>□ Tell me about your experiences, activities and tasks in the context of PSADs use and non-use in community-dwelling older persons.</li> <li>□ What challenges of PSAD use or non-use are you encountering?</li> <li>□ What is your own everyday experience with technology at work?</li> </ul> <p>General Practitioners</p> <ul style="list-style-type: none"> <li>□ Tell me about your activities and tasks regarding safety in patients 70+ years of age living at home. (introductory question 1)</li> <li>□ Tell me about the significance you attribute to the topic of falls in older patients in your own practice. (introductory question 2)</li> <li>□ Which health professionals are involved (in your own experience) in the topic of falls?</li> <li>□ What is your own everyday experience with technology at work?</li> <li>□ Tell me about your experience regarding PSAD use and non-use.</li> <li>□ What challenges of PSAD use or non-use are you encountering? <ul style="list-style-type: none"> <li>□ An emergency button;</li> <li>□ An emergency watch;</li> <li>□ A house emergency call combined with an alert bracelet or necklace;</li> <li>□ A mobile phone with speed dial buttons;</li> <li>□ A senior-friendly telephone combined with an alert bracelet or necklace;</li> <li>□ A sensor mat for a chair and for the floor;</li> <li>□ A radio transmitter fall detector;</li> <li>□ An infrared sensor;</li> <li>□ A camera-based-system;</li> <li>□ A wearable fall detection sensor (prototype)</li> </ul> </li> </ul>
<b>Presentation of ten PSADs</b> (all devices available on the national market at that time, in order not to favor any device, plus one prototype)	
<b>Second part</b>	<p><b>Questions addressed in all focus groups and interviews:</b></p> <p>All</p> <ul style="list-style-type: none"> <li>□ What are advantages and opportunities in using PSADs?</li> <li>□ What are disadvantages and challenges in using PSADs?</li> <li>□ What additional thoughts and issues do you have that we haven't yet addressed?</li> </ul>

reading, two researchers individually produced a narrative storyline of each interview, which were compared and discussed in team meetings (stage 2). During this stage, the team focused on gaining an initial understanding of the particular content of the stories as they were told from the perspectives of the relatives, community nurses and GPs. In stage 3, the researchers discussed the story lines and the analysis proceeded from the concrete, interview, storyline level to a more abstract concept level. The emerging concepts were then organized into a first, tentative coding scheme. This coding scheme was subsequently applied, tested, refined in five iterative coding cycles of open and focused coding.<sup>28</sup> The codes were compared within and across the cases. Data were linked to codes, and the coding was discussed. The coding scheme was thus successively adapted and refined into a final coding scheme (stages 4–7). The continued discussion ensured a good fit between the codes and the data. The final coding scheme was applied to all 26 cases.

Throughout all analysis stages, memos containing questions or comments regarding the development of the coding scheme were written and discussed during team meetings.

To deepen the level of abstraction, the codes were merged to categories and subcategories. The characteristics of categories and subcategories were described, and the descriptions compared within and among the categories and subcategories to ensure there was no overlap in meaning. The descriptions were also compared to the original interview data. The comparison and review of original data and the coding enabled the researchers to identify the relationships between the categories and subcategories (stages 8–10). This review and comparison at an abstract level lead to a model describing the negotiation process about the use of the PSAD from perspectives of relatives, community nurses and GPs (Fig. 1).

A research diary was kept during the whole analysis and interpretation process, in order to keep a reflexive record of decisions made and trace emerging thoughts and questions, as well as to ensure the grounding of the findings in the data. Data management was

supported by MAXQDA software (VERBI GmbH, Berlin, Germany; Version 12 and 2018).

The study's scientific rigor was ensured through a variety of techniques. The iterative analysis, stepwise move towards abstraction, and regular discussions of interpretations in the research team strengthened the criticality and integrity of the analysis.<sup>29</sup> The research diary, memos and the parallel analysis process of two coders ensured that the findings reflect the participants' experience and are grounded in the data.<sup>29</sup> Since the transferability of all qualitative research is limited,<sup>30</sup> we described the setting and sample precisely and illustrated our findings with quotes from the interviews.

#### Ethical consideration

The study was conducted in compliance with Swiss national, legal and regulatory requirements. A cantonal ethics committee confirmed that the Swiss Federal Act on Research Involving Humans did not apply to the research project. Written and verbal informed consent was obtained prior to study participation. Personal data were de-identified in the transcripts.

## Findings

### Participant characteristics

Fifteen focus groups and 11 semi-structured interviews were conducted. A total of 78 persons participated: 33 relatives (24 daughters, 8 sons, 1 husband) with an average age of 55 years; 34 community nurses with on average 19 years of experience; 11 GPs with on average 29 years of experience. PSAD experience differed among the participants: 14 relatives, 18 community nurses and six GPs indicated experience with using a PSAD in the care of an older adult. Further characteristics are displayed in Tables 3 and 4.

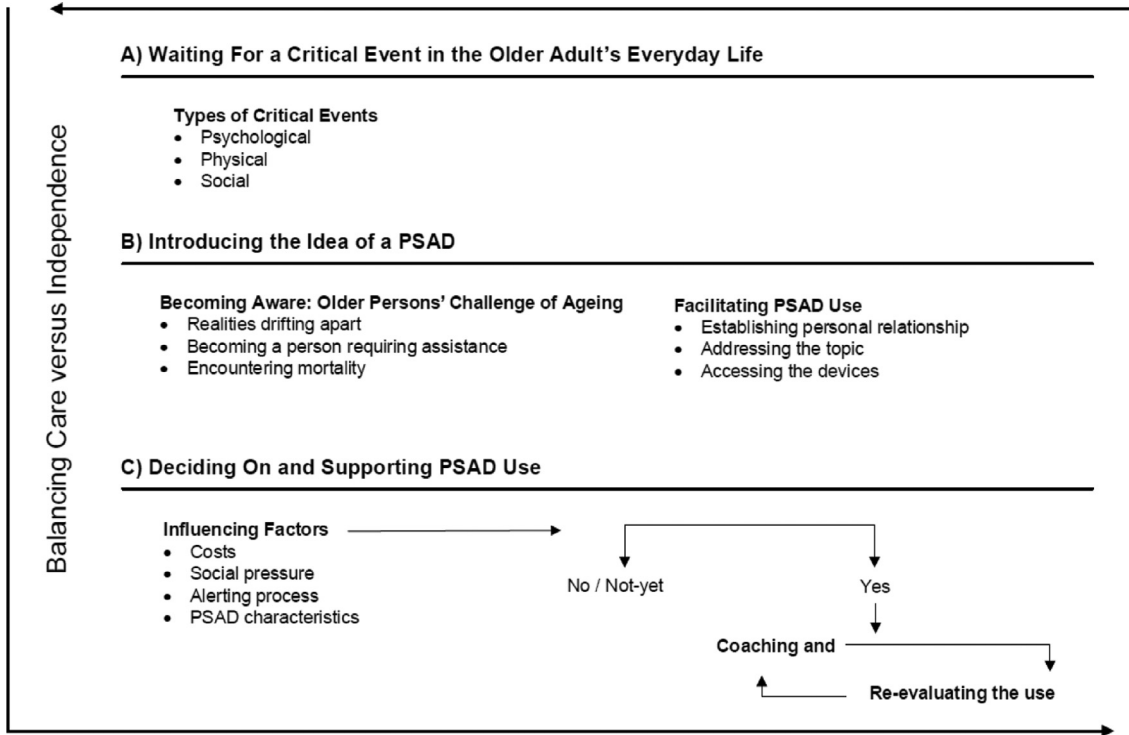


Fig. 1. Descriptive model of the negotiation process.

**Table 3**  
Characteristics of study participants – relatives.

	N (%)	Mean	Range
Relatives (N=33)			
Age		55.2	(31 – 72)
Female	24 (72.7)		
For whom is the PSAD in your family?			
Father	14 (42.4)		
Mother	21 (63.3)		
Wife	1 (3.0)		
Mother-in-law	1 (3.0)		
Aunt	2 (6.0)		
Is 'the older person' already using a PSAD? – yes	7 (21.2)		
Do you have experience with PSADs? – yes	14 (42.4)		
Do you think 'the older person' will use a PSAD?			
Yes	18 (54.5)		
No	13 (39.4)		
Don't know	2 (6.1)		
Did 'your' older person fall in the last 12 months?			
Yes	18 (54.5)		
No	11 (33.3)		
I don't know	4 (12.1)		
Do you think that 'your' older person is unstable while walking?			
Yes	11 (33.3)		
No	9 (27.3)		
Sometimes	13 (39.4)		
Does 'your' older person use a walking aid?			
Yes	6 (18.2)		
No	24 (72.7)		
I don't know	3 (9.1)		
Do you fear that 'your' older person might fall?			
Yes	11 (33.3)		
Sometimes	13 (39.4)		
No	9 (37.3)		

*A negotiation process*

PSAD use was considered to be complex. Relatives, community nurses and GPs were often involved in a relatively long negotiation process with older adults (Fig. 1).

In this process, whereas the relatives, community nurses and GPs perceive a safety issue and thus a need to protect the older adult by suggesting a PSAD, they described how this suggestion is often experienced as a threat to the older adult's independence. The negotiation process therefore requires **balancing care versus independence**. Three phases were distinguished: A) Waiting for a critical event in the older adult's everyday life; B) Introducing the idea of a PSAD; and C) Deciding on and supporting PSAD use. These phases are characterized by subthemes marked below in bold and italics.

*Phase A) Waiting for a critical event*

Relatives, community nurses and GPs typically reported that the negotiation process was initiated because of their concern for the safety of the older adult. This safety concern was often related to a pivotal psychological, physical and/or social event that opened a window of opportunity to discuss the need for a PSAD. A **psychological event** is an incident, often after a fall, which involves feeling helpless, needing assistance, or experiencing anxiety or fear of falling. A deterioration of mobility and health, e.g. gait instability or dizziness, is referred to as a **physical event**, while the term **social event** describes, e.g., the situation in which an older adult falls or experiences an emergency, but the event goes unnoticed because of a lack of social contacts or because frail partners cannot assist each other.

*Phase B) Introducing the idea of a PSAD*

In taking advantage of a critical event, relatives, community nurses and GPs shared the same experience: talking about PSAD use involved surprisingly confrontational discussions, especially when

**Table 4**  
Characteristics of study participants – community nurses and general practitioners (GPs).

Characteristics	Community Nurses (N = 34)			GP (N = 11)		
	N (%)	Mean	Range	N (%)	Mean	Range
Age		43.5	23–60		59.1	44–74
Female	32 (94.1)			1 (9.1)		
Professional Education (n = 32)						
RN with vocational training	30 (93.8)					
RN with University degree BScN	2 (5.9)					
Professional experience as Registered Nurse (years)		19.1	0.3–40.0			
Professional experience as Medical Doctor (years) (n=10)					28.5	9–50
Working experience in current position (years)		6.4	0.3–29.0		17.1	0.6–35
Do you have experience with PSADs? Yes	18 (52.9)			6 (54.5)		
				(N = 10)		
What kind of PSADs have you already 'used' in patient care?						
Manual emergency button	25 (73.5)			9 (81.8)		
Manual emergency necklace	19 (55.9)			2 (18.2)		
Watch with voice speakerphone and GPS	19 (55.9)			6 (54.5)		
Mobile	9 (26.5)			3 (27.3)		
Sensor mats	5 (14.7)			6 (54.5)		

relatives made the older adults aware of their aging process (**Becoming aware: older adults' challenge of aging**). While the participants suggested the use of a PSAD increase safety of the older adult, the older adult often first denied such a need and felt that a PSAD would undermine his/her independence:

"In the case of my parents, the (PSAD) was a long process of raising awareness. We can fully understand you, they told us: But why are you (children) intruding into our life? We've managed it until now and that will continue" (Relative (R)-FG6-60).

Relatives said they often felt challenged by encountering conflictive discussions with their parent/s, who often do not share their children's safety concerns. Likewise, community nurses and GPs reported often encountering these conflicting views concerning safety and ability to manage everyday life (**realities drifting apart**). GPs explained these different realities by noting that the home environment has for decades been a place for older adults to feel safe, contrary to the perception of relatives. Community nurses agreed that the PSAD opens up a discussion not solely about using a device, but also about **becoming a person requiring assistance**, citing a client who said:

"First of all, I'm healthy, I'm fit as a fiddle, I'm not old, even if I am 98. Why should I fall, what are you suggesting? You (the nurse) want to disable me, you are going to make me dependent" (Community nurses (N)-FG4-195).

Relatives, community nurses and GPs had experienced older adults concealing falls or fall consequences because they feared receiving more support/assistance at home or relatives pushing for institutionalization. Some relatives critically reflected that although it would be sensible to use a PSAD, they observed that the PSAD triggers complex feelings of loss:

"It looks simple and common-sense from the outside, not limiting at all, but, in the older adult it causes melancholy. Simply realizing that they are no longer at the wheel (in charge of one's life) ... I believe that is the resistance (to the PSAD)" (R-FG3-54).

GPs recognized this observation, namely the feeling of losing control. From their perspective this loss is underlined by the fact that PSAD use often reveals unclarity about the alerting process (e.g. Does it work? Who will answer?) and what might happen afterwards (e.g. hospitalization).

The focus groups/interviews revealed that talking about PSADs may also signify **encountering mortality**. Relatives, community nurses and GPs agreed that older adults frequently express a strong wish to live at home until death. This strong wish seems to explain why they might conclude that a PSAD is unnecessary: first, a PSAD is directly connected with a hospital, a place where life is artificially prolonged, and, second, a hospital stay might be a possible gateway to a long-term care institution. Additionally, particularly community nurses and GPs added, older adults frequently believe - or want to believe - that a fall is fatal.

"I had several patients who told me: I don't like it (a PSAD) I would like to die in my apartment. If I should fall and it's the end, that's just how it is. Therefore, I don't want a button (PSAD). They told me clearly about that" (N-FG9-197).

Relatives, community nurses and GPs brought up the topic of **facilitating PSAD use**, which takes time, often months. Mainly community nurses underlined that **establishing a personal relationship** of mutual trust is pivotal. This echoes the finding that community nurses and relatives wait for the right situation to address the topic of PSADs, with relatives choosing among siblings as to who can best address it. **Addressing the topic** of PSADs was reportedly delicate for all participants, as it goes hand in hand with the topic of falling. Relatives, community nurses and GPs reported that older adults not only suffer from physical consequences, such as injuries, but that in their perception a fall is often recognized as a clear sign of emerging frailty.

Community nurses and GPs addressed the topic of PSADs mostly in the context of a critical event or as coming from a relative or the older adult her-/himself. Additionally, the analysis revealed that addressing the topic of PSADs also depends on the health professional's perception, i.e. how relevant s/he considers the topic.

Addressing the topic of PSADs necessitates **accessing the devices**. Relatives pointed out that they first have to acquire the relevant knowledge themselves. They complain that access to PSADs is challenging and time-consuming, requiring internet searches, identifying relevant institutions and talking to friends, colleagues or neighbors. Relatives would welcome the possibility to look at, touch and test various PSADs in a public health-care institution with their parent/s.

In contrast, the participating community nurses and GPs had access to PSAD information and distributed contact details of providers and/or information. Nevertheless, most delegated the examination and consideration of PSADs to the older adult and/or their relatives. Only a few nurses

said they provided additional information by comparing devices, sharing experiences from other users, discussing advantages and drawbacks as well as talking about costs. A majority mentioned that they would like to have more knowledge about PSADs, remarking that older adults and relatives would like information from a neutral source such as themselves. Some community nurses added a reason for advising in passing: there is no financial reimbursement for such counselling services. GPs indicated that PSAD advice is not their responsibility. However, most of them provided flyers on PSADs, which they received as publicity, in their waiting room. A few GPs said they would like to have more knowledge about PSADs, suggesting an online platform summarizing all providers and information.

#### Phase C) Deciding on and supporting PSAD use

Relatives, community nurses and GPs discussed three types of decision they are confronted with in older adults: no, not-yet and yes (**Deciding on PSAD use**). Those decisions are valid at a particular point in time, but need to be revisited and modified, depending on the trajectory of the older adult's life. Especially community nurses and GPs highlighted that negative decisions should be accepted, and the question of whether to use a PSAD should be re-initiated after a next critical event. Whereas some relatives thought that PSAD use could be imposed upon their parent/s, others tried to convince them with steady pressure, possibly with the help of health professionals. In contrast, community nurses and GPs agreed that the decision should be made by the older adult, because their independent decision also increases the chances they will use a PSAD.

"They tend to use it if they can decide for themselves. I believe this is really crucial." (N-FG6-154).

Nevertheless, the health care professionals added that relatives are frequently involved in the decision-making.

According to the relatives, community nurses and GPs, different **influencing factors** affect the decision-making, namely, costs, social pressure, the alerting process and PSAD characteristics. They pointed out that **costs** are an important issue, because PSADs currently have to be paid for by users (although in some cases social allowances are possible). Particularly community nurses challenged this reason, however. They viewed costs as a primary counterargument when the older adult is not convinced a PSAD is necessary, observing that most pensioners are too wealthy for social allowances or refuse to request them. Similarly, GPs mentioned costs, arguing that health or social insurance should bear the expenses of PSADs, because in the end they save money by allowing therapies to be started earlier and hospitalizations to be shortened or avoided.

**Social pressure** refers to the influence of the older adult's social network on PSAD use. Surprisingly, relatives, community nurses and GPs attributed greater influence to others than to themselves. Relatives might turn to nurses or to GPs to negotiate more successfully on PSADs. Some community nurses were convinced that in particular situations relatives or GPs might have a greater impact. GPs considered themselves to have only limited influence, less than community nurses and relatives. Some relatives pleaded with their parent/s to use a device for their sake. Others instead 'imposed' a deal:

"The deal is that she (mother) concedes us a certain peace of mind, although she first disliked the watch (PSAD). We told her that this is the price of her independence, which she accepted. (...) She must also make concessions to us" (R-FG2-50).

Social pressure can also reverse acceptance, mainly when a PSAD was obtained without the approval of the older adult, which is quite

commonly observed by community nurses and some GPs. Especially community nurses often experienced older adults owning a PSAD but not using it. In this case, it had often been supplied by a relative.

A further influencing factor was the **alerting process**, defined by how (technical) and to whom (contact persons) the alert is transmitted and how the contacted person will intervene. Several community nurses and GPs were convinced that clarity about the alerting process is a key to PSAD use.

"If you want to ensure that the PSAD is used, you have to make clear to the patient that their preferences are considered. (...) there should be no automatism for hospitalization. Because this is often what they fear. The bottom line is that the patients must know that activating an alert signifies that they will be helped, but only in a way they prefer, accepting that it might be different. I think this is key" (GP-18-53).

The nurses emphasized that, in general, older adults want to have a community nurse as a contact person, which is not yet widespread. Furthermore, community nurses believe that being a contact person and deciding on the next steps in an emergency might be overstepping relatives' right. GPs mentioned that older adults are often suspicious of unknown people entering their home; therefore, relatives should be part of the alerting process.

Relatives were particularly concerned with **PSAD characteristics**. Beyond ease of use and aesthetic aspects of the device, e.g. color and design, they emphasized, in agreement with community nurses and GPs, that reliable alerting is crucial and should function in- and outdoors. Thus, older adults would be more likely to use a PSAD. Whereas nurses and GPs typically advocate a manually activated alerting device, relatives prefer an automatic one, to cover situations where consciousness is lost. Nurses and GPs argued for manual devices because this underpins the perception of independence and control for the older adult:

"Whether she/he pushes the button when she/he falls or tries to get up for two hours, it is still her/his decision" (GP-16-59).

If a PSAD is used, a post-decision stage called **coaching and re-evaluating PSAD use** should follow. Relatives, community nurses and GPs reported that, when a PSAD is chosen, the providing company oversees installation of the device and explains how it works. Some providers require the older adult to test the PSAD once a month, while relatives reported that they acted as the contact person. The involvement of community nurses during PSAD use was hardly discussed, some arguing that this is managed between the older adult and the provider. Some community nurses reported that they monitored everyday use, which might even be requested by relatives. However, few nurses check on how regularly a PSAD is used or think about how to improve everyday use. Several self-critically added that they should not only focus on enabling PSAD use, but also on providing more coaching and re-evaluation of use. In the case of non-use, community nurses and GPs said they would wait for another critical event to re-initiate the negotiation process.

#### Discussion and recommendations

This study aimed to explore the perspectives of relatives, community nurses and GPs on why and when PSADs are used by community-dwelling older adults and on their involvement in PSAD use and non-use. The findings revealed that PSAD use is the result of a negotiation process between these participants and the older adult, comprising three major phases: A) waiting for a critical event in the older adult's everyday life; B) introducing the idea of a PSAD and C)



deciding on and supporting PSAD use. Core to the negotiation process is the balancing of care versus independence.

Overall, it is noteworthy that all participants agreed that suggestions about using a PSAD are often perceived by older adults as a threat to their independence. This reflects research describing that independence and control over daily life are pivotal for older adults.<sup>31,32</sup> Furthermore, older adults might regard using a PSAD as synonymous with a 'declaration of frailty'.<sup>21</sup> Becoming dependent on others can be related to decreased well-being and feelings of helplessness.<sup>33</sup> This finding suggests that in order to increase PSAD acceptance, community nurses and GPs should explain how a PSAD supports independence by increasing safety, and elucidate a transparent alerting process with the older adult to address the fear of being hospitalized or institutionalized. This should promote a more positive attitude to PSAD use.

Although it might be surprising, many older adults seem to regard a PSAD as an invisible link between their home and an institution (care home or hospital). As a consequence, they may perceive a threat to their wish to die at home. This concern about not being able to die at home is not unjustified however: until 2011 in Switzerland, some 80% of older adults died in a hospital or care home.<sup>34</sup> Our findings suggest that the conversation of health professionals about personal safety and the use of a PSAD should include an in-depth discussion about PSAD response chains in relation to personal wishes and needs regarding hospitalization and institutionalization. Older adults have to trust the response system and those involved. Thus, preferences for interventions in an emergency, their preferred location for dying and the meaning of 'living as long as possible at home' can be clarified with the older adult and their relatives.

Our study offers a model with three iterative phases of negotiation to explain why PSADs, which are advisable for improving safety, are infrequently used by older adults and how their use can be facilitated. Regarding the phase **A) Waiting for a critical event in the older adult's everyday life**: Older adults are reported to be more motivated to use a PSAD when they have experienced a fall or related insecurity.<sup>9,16</sup> This resonates with our findings by demonstrating that critical events are important for choosing the right moment to address the use of PSAD. Additionally, our findings provide valuable insights firstly by identifying further critical events and secondly by suggesting that although a critical event may occur, as long as the older adult does not perceive it as critical, she/he will not use a PSAD. Therefore, relatives and health professionals felt 'constrained' to wait for another window of opportunity. At first glance, this finding seems difficult to explain, as a critical event may mean physical and psychological suffering. However, a possible explanation is that older adults perceive themselves as secure and independent when living at home in the community;<sup>35</sup> thus, experiencing insecurity might be a prerequisite for PSAD use.

Regarding phase **B) Introducing the idea of a PSAD**: That relatives, community nurses and GPs may all act as PSAD facilitators is consistent with other study findings.<sup>9,15,20</sup> Our study provides additional insight by indicating that a trusting relationship is considered to be a precondition. This is interesting, as a trusting healthcare professional-patient relationship is also acknowledged to be essential for effective health counselling<sup>36</sup> and related to more beneficial patient health behaviors.<sup>37</sup>

Regarding relatives, our findings go beyond depicting a solely facilitative role<sup>18</sup> by showing that relatives can also affect PSAD use negatively. Although our study indicates that relatives often play a critical role in providing information and are involved in the decision-making process, health professionals mentioned that relatives may exert pressure or provide a PSAD without consent, consequently pushing older adults to refuse it. A possible negative influence on technology use is described by Luijckx, Peek, Wouters,<sup>19</sup> who found that older adults may generally feel coerced by their children into using technology. However, relatives may be driven by a sense of

duty.<sup>38</sup> Therefore, it seems essential that relatives know the importance of critical events and their role in the negotiation process. They should be enabled to use the right moments to (re-) initiate PSAD negotiations as well as to balance their desire for care and security with their parent's desire to maintain independence in daily life. The findings also suggest that community nurses and GPs should question their practice of delegating the negotiation process to relatives.

Regarding phase **C) Deciding on and supporting PSAD use**: Our study shows that particularly relatives and community nurses were involved in the decision process. Surprisingly, all actors lacked knowledge and know-how regarding PSADs, e.g. diversity, concrete use or advantages and disadvantages of a device. We argue that particularly community nurses need to be aware of the negotiation process and have enough knowledge to provide appropriate and comprehensive PSAD counselling, as their professional role is to help individuals manage daily life and safe living.<sup>39,40</sup> Additionally, counselling is needed for older adults without children, and information for relatives whose parent/s is/are not yet in contact with community nurses of a community care service provider. It is conceivable that a specialized community nurse might provide PSAD counselling. This could be combined with the possibility to touch and test PSADs, which we identified as being crucial for the decision process. GPs might systematically assess critical events, provide first information and refer to community nurses.

#### *Strengths and limitations*

A strength of this study is the reflexivity during data collection and the inductive and deductive coding analysis process. Regarding data collection, the first author critically reflected on the thematic course of each interview and focus group in terms of similarities and new insights and integrated them into the subsequent data collection. Thus, rich perspectives could be captured. A further strength is the range of perspectives provided by three different types of participants. In addition, the research group was involved in the analysis and interpretation of the findings.

A few limitations of this study should be considered when interpreting the findings. First, most of the focus groups with community nurses were conducted with three participants, which could have led to a lower thematic diversity in the discussions. It was not possible to recruit community nurses outside of their working hours and community care services agreed to releasing only three nurses at a time.

Second, the purposeful and snowball sampling method might also be considered a limitation. We recruited relatives through flyers in official places such as pharmacies, fitness centers, etc., and via mail. We did not directly approach potential participants. This method precluded us from tracking the number of relatives invited and how many refused to participate. The community nurses were recruited via community nurse care managers. We approached 42 community care service providers, seven agreed to participate. The community nurse managers recruited 3–5 community nurses per provider. Since staff resources are scarce in the community, we abstained from asking how many persons they asked and how many refused to participate. We did not want to impose an additional burden and jeopardize the care service provider study participation. Finally, we approached 94 GPs, and 11 agreed to participate (response rate 11%). We anticipated that recruiting participants might be challenging and thus aimed to reach as many potential participants as possible with our strategy, instead of focusing on a clearly defined number of potential participants. Moreover, we potentially attracted volunteers with a specific interest in the topic and more relatives of robust than of frail older adults might have participated. However, the sample size,<sup>41</sup> the data collection and analysis supported data saturation, as rich perspectives were captured and themes were confirmed across interviews and focus groups. Lastly, the findings apply to the population studied and may not be applicable to other populations with different cultural and societal perspectives.

## Conclusions

The actors involved in PSAD use and non-use, relatives, community nurses and GPs, should be aware of the PSAD negotiation process, which is complex, dynamic, iterative and needs time. This process can enable the older adult to make an informed decision about PSAD use, which might be reconsidered later. Throughout the negotiation process relatives, community nurses and GPs need to balance the perceived care need versus the perceived need of the older adult for independence in daily life.

Relatives and community nurses are predominantly involved in the negotiation process. GPs are less involved but can identify critical events, positively influence older adults' decision-making and refer to community nurses for further counselling.

The PSAD perception of the older adult is essential. To date, it seems that a PSAD is regarded as an invisible link between home and an institution. Health professionals need to clarify the alerting process, i.e., to discuss mortality, hospitalization and institutionalization. Relatives and health professionals can influence older adults at an early stage by explaining how a PSAD can substantially support living independently longer.

Although community nurses may play a pivotal role during the negotiation process, they lack knowledge regarding comprehensive counselling on PSADs, e.g. different models of PSADs or the alerting process. Relatives are interested in user experiences, the pros and cons of different models, and in the opportunity to touch and test the devices with their parent/s. Older adults and relatives need to be supported, as conflicting situations are probable at the beginning of the negotiation process. Therefore, specialized community nurses may be the key to further improving and facilitating the decision about PSAD use and thus to supporting safe aging in place.

The suggested descriptive model could benefit from further exploration, particularly elucidating the kind of support community-dwelling older adults need, and from whom, when using a PSAD. Thus, supportive interventions for community-dwelling older adults could be developed and tested. In addition, the negotiation process described could serve as an example for decisions on the use or non-use of other technologies in the context of aging in place.

## Conflict of interest

We have no conflict of interest to declare.

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