

## ORIGINAL ARTICLE

# Knowledge and Attitude of Community Nurses on Pressure Injury Prevention: A Cross-sectional Study in an Indonesian City

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## Abstract

The objectives of this study were to examine the knowledge and attitude of Indonesian community nurses regarding Pressure Injury (PI) prevention. A cross-sectional design was used and included the community nurses permanently working in the Public Health Center (Puskemas) in Bandung, West Java Indonesia. Knowledge was measured using the Pressure Ulcer Knowledge Assessment Tool (PUKAT 2.0). Attitudes were measured using a predesigned instrument which included 11 statements on a five point Likert scale. All data were collected using paper-based questionnaires. The response rate was 100%. Respondents (n = 235) consisted of 80 community nursing program coordinators (34.0%) and 155 community nurses (66.0%). Regarding knowledge, the percentage of correct answers in the total group of community nurses on the PUKAT 2.0 was 30.7%. The theme “Prevention” had the lowest percentage of correct answers (20.8%). Community nurses who had additional PI or wound care training had a higher knowledge score compared with community nurses who did not have additional PI training (33.7% vs 30.3%;  $Z = -1.995$ ;  $P = 0.046$ ). The median attitude score was 44 (maximum score 55; range

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28–55), demonstrating a positive attitude among participants towards PI prevention. Further, the higher the education status of participants, the more positive the attitudes ( $H = 11.773$ ;  $P = 0.003$ ). This study shows that community nurses need to improve their basic knowledge of PI prevention. Furthermore, research should be performed to explore what community nurses need to strengthen their role in PI prevention.

#### KEYWORDS

attitude, community nurses, knowledge, pressure injury, prevention

## 1 | INTRODUCTION

Pressure Injuries (PIs) are a global health care problem. A pressure injury (PI) is a localised damage to the skin and/ or underlying tissue which usually occurs over a bony prominence, as a result of pressure or pressure in combination with shear.<sup>1</sup> A PI may also be caused by a (medical) device.<sup>1</sup> It affects people's quality of life emotionally, physically and socially,<sup>2–4</sup> and even poses a higher risk of dying.<sup>5,6</sup> A PI can be categorised into six categories: category/stage 1 to 4, unstageable and suspected deep tissue injury. Higher categories indicate deeper damage to the skin and/or underlying tissue.<sup>1</sup>

In the community, the prevalence and incidence rates of PIs are high in certain populations, such as community-dwelling older adults.<sup>1</sup> A study in the United States reported that most patients (70.6%) who had a PI on admission to the hospital were older adults living at home (mean age 72.7 years).<sup>7</sup> Another study in the United States noted that having a PI was an important reason for re-admission to the hospital among older adults living at home.<sup>8</sup> Furthermore, an Indonesian study which focused on the prevalence of PIs among Indonesian older adults living at home concluded a PI prevalence rate of 11% of which 52% suffered from a PI category 1,<sup>9</sup> a category which might have been preventable and important to be considered as a sign for increased vulnerability and risk and PI development.<sup>1</sup> Of concern in this study was that even though some of the PI patients used formal care in the last months, none of them received formal PI prevention or treatment from health care professionals.<sup>9</sup>

To deliver evidence-based PI prevention and/ or treatment, health professionals need adequate knowledge.<sup>1</sup> Furthermore, understanding staff attitudes towards PI prevention is important because a positive attitude is considered to be a precursor to behaviour.<sup>10</sup> The European Pressure Ulcer Advisory Panel (EPUAP), National Pressure Injury Advisory Panel (NPIAP) and Pan Pacific Pressure Injury Alliance (PPPIA) recommend regularly

#### Key Messages

- Community nurses in Indonesia have significant knowledge deficits with regard to PI prevention. Research is needed to assess how their knowledge can be improved
- Community nurses in Indonesia have a positive attitude towards pressure injury prevention
- Further research should focus on barriers to and facilitators for providing PI prevention carried out by community nurses

assessing knowledge and attitude of health care professionals on pressure injury care.<sup>1</sup> In addition, former studies showed that knowledge and attitude correlate positively with the practice of PI prevention.<sup>11,12</sup>

In Indonesia, community nurses play an important role in targeting community health problems.<sup>13–17</sup> They perform a range of activities, including health promotion, disease management, and public health activities, such as community empowerment.<sup>13</sup> PI prevention is also one of their official responsibilities. However, based on our best knowledge, no studies are available focusing on community nurses' knowledge and attitude towards PI prevention. Various studies have evaluated the knowledge about and attitude of nurses towards PI prevention<sup>11,12,18–29</sup> but most of these studies focused on nurses working in hospitals or nursing homes. One study in Australia focusing on knowledge and attitudes of nurses towards PI prevention recruited nurses from the hospital and a community health centre, but did not describe the results separately for the two groups.<sup>12</sup> Therefore, this study aims to fill this knowledge gap by examining Indonesian community nurses' knowledge of and attitude towards PI prevention.

## 2 | METHODS

### 2.1 | Design

The study used a cross-sectional survey design.

### 2.2 | Participants

Participants eligible for this study were community nurses permanently working in the Public Health Center (Puskemas) in Bandung, West Java Indonesia. To be included in this study, participants needed to have at least a vocational nursing degree (3 years of nursing education).

### 2.3 | Measurement instruments

The instrument used in this study was a paper-based questionnaire including questions pertaining to demographic characteristics, knowledge of, and attitude towards PI prevention.

### 2.4 | Demographic characteristics

The demographic characteristics addressed in the questionnaire were gender, age, years of working experience as a community nurse, type of education, and additional training in pressure injury or wound care.

### 2.5 | Knowledge

Knowledge was measured using the Pressure Ulcer Knowledge Assessment Tool (PUKAT 2.0). The PUKAT 2.0 has been created according to evidence-based guidelines for PI prevention and validated by Manderlier et al.<sup>30</sup> This instrument has excellent psychometric properties (average of item difficulty = 0.56;  $\alpha$ -value = 0.16; ICC = 0.69) and can be used internationally.<sup>30</sup> The instrument is a questionnaire consisting of 28 items including six themes<sup>1</sup>: “Aetiology” (7 items)<sup>2</sup>; “Classification and observation” (4 items)<sup>3</sup>; “Risk assessment” (2 items)<sup>4</sup>; “Nutrition” (3 items)<sup>5</sup>; “Prevention of PI” (8 items) and<sup>6</sup> “Specific patient groups” (4 items). All items have five multiple-choice answers including the response option “I do not know the answer”. The items were developed taking into account different cognitive levels (following the revised version of Bloom’s taxonomy<sup>31</sup>), i.e. level 1 “remembering”; level 2 “understanding”; level 4 “analysing”; and level 5 “evaluating”. An example item in the level of

remembering is “What is a cause of pressure ulcers?” with the multiple-choice answer options: (a) Diabetes; (b) The use of corticosteroids; (c) Hypertension; (d) Tissue oxygenation; and (e) I do not know the answer. A complete English version of the instrument can be found in the publication of De Meyer et al.<sup>18</sup>

### 2.6 | Attitude

Attitudes towards PI prevention were measured using a questionnaire developed by Moore and Price.<sup>32</sup> This questionnaire consists of 11 statements on PI prevention, such as “All patients are at potential risk of developing pressure injuries”, Participants have to indicate to what extent they agree with the statements on a five point Likert scale, ranging from “strongly agree” to “strongly disagree”.<sup>32</sup> The questionnaire showed a satisfactory internal validity (Cronbach  $\alpha$  = 0.91).<sup>20</sup>

### 2.7 | Face validity and content validity of the translated questionnaire

Both the PUKAT 2.0 and the attitude questionnaire were translated from English into the Indonesian language using the method of translation/back-translation.<sup>33</sup> Permission for using and translating the instruments were obtained via email from the questionnaire developers. Two bilingual nurses performed the English to Indonesian translation, and a certified translator undertook the back translation. Then, two other bilingual nurses who have experience in PI studies checked the concordance of the English and Indonesian versions of the questionnaire. As this study was the first to use the questionnaires for community nurses instead of nurses working in the hospital or nursing home, the Indonesian version of questionnaires were also reviewed for face and content validity by 22 experts from the Indonesian Community Nursing Association and Indonesian Wound Ostomy and Continence Nursing Association. They both received the English and Indonesian versions of the PUKAT 2.0 and the attitudes questionnaire and were asked to assess the clarity of wording in the questionnaires, as well as the relevance of each item for community nurses specifically. For each item in each questionnaire, experts were asked to assess the item using a four-point Likert scale with the options (a) not relevant for community nurses/remove question; (b) somewhat relevant for community nurses/major revisions to the item needed; (c) quite relevant for community nurses/minor revisions to the item needed; and (d) highly relevant for community nurses/maintain the item. In general, the experts did not have any problems with the

wording (Item content validity index/I-CVI = 0.90) and agreed that both questionnaires are relevant to be used for community nurses (Scale content validity index/S-CVIs = 1.00).

## 2.8 | Data collection procedure

All data were collected by the first author SPS in February 2020 using paper-based questionnaires. Recruitment of participants took place in collaboration with the Health Department of Bandung city. First, the Health Department invited all coordinators of the community nursing program from all Public Health Centres in Bandung to a meeting. These coordinators are located in different public health care centres in the community and coordinate community care in the area of their centre. During this meeting, the coordinators received information on the objectives of this study by author SPS and were asked to participate. If they agreed to be participants and signed the informed consent form, they immediately filled in the questionnaire. Afterwards, the coordinators received a number of blank questionnaires to be distributed to community nurses of their own Public Health Centres. The community nurses from these Public Health Centres were informed about the objectives of the research by the coordinators in their own place. If they agreed on participation, they signed the informed consent form and completed the questionnaires. The completed questionnaires were sent to the Health Department for then collected by the author SPS.

## 2.9 | Ethical considerations

This study received ethical approval from The Research Ethics Committee Universitas Padjadjaran Bandung (No. 138/UN6.KEP/EC/2020). Furthermore, two governmental institutions which have responsibilities in health care and community protection approved the research project before it was undertaken (the Indonesian Health Care Agency #070/3210-Dinkes and the National Unity Agency, Politics and Protection of the Regional People #070/167/I-2020/BKBP). Participants were not obligated to participate and could refuse participation before and during the assessment procedure.

## 2.10 | Data analysis

Data were analysed using IBM SPSS Statistics 26 (IBM Corp, Armonk, NY). The answers on the PUKAT 2.0 were recoded as correct ('1') or wrong ('0'). Items scored as

"I don't know the answer", as well as multiple answers to one question were coded as wrong ('0'). Hence, sum scores were calculated to obtain a total score which was presented as a percentage of the maximum possible score.

Regarding the attitude questionnaire, the sum score on the questionnaire ranges from a minimum of 11 to a maximum of 55. Due to non-normal distribution of data, data are presented using medians and range. A higher sum score indicates a more positive attitude towards PI prevention.

Bivariate comparison analyses were conducted using independent sample *t*-test and ANOVA tests with Post-Hoc Befferoni analysis when the Levene's test was non-significant. Mann-Whitney *U*-tests and Kruskal-Wallis tests were used in case of a significant Levene's test. A significance level of 0.05 was used.

## 3 | RESULTS

### 3.1 | Participant characteristics

In total, 235 community nurses were asked to participate in this study. The response rate was 100%, meaning that

**TABLE 1** Characteristic of participants

Characteristics of Participants	Participants (n = 235) n (%)
Gender	
Male	52 (22.1)
Female	183 (77.9)
Age category	
<25 years	10 (4.3)
25–34 years	67 (28.5)
35–50 years	91 (38.7)
>50 years	67 (28.5)
Working experience as a community nurse	
<2 years	16 (6.8)
3–5 years	31 (13.2)
6–10 years	45 (19.1)
11–20 years	61 (26.0)
>20 years	82 (34.9)
Education	
Vocational degree	152 (64.7)
Bachelor degree	80 (34)
Master degree	3 (1.3)
Additional training in PI/wound care (not specific training)	
Yes	28 (11.9)

TABLE 2 Results on the PUKAT 2.0 in total and per subtheme

Participants (n = 235)	Total Score		Aetiology		Classification and Observation		Risk Assessment		Nutrition		Prevention of PI		Specific Patient Group	
	Mean % (SD)	Difference	Mean % (SD)	Difference	Mean % (SD)	Difference	Mean % (SD)	Difference	Mean % (SD)	Difference	Mean % (SD)	Difference	Mean % (SD)	Difference
Overall	30.7 (8.6)		33.5 (16.0)		35.8 (24.8)		27.6 (29.6)		54.0 (29.2)		20.8 (13.2)		24.6 (21.8)	
<b>Gender</b>														
Male	29.7 (9.6)	$t = -.926$ $P = .356^a$	28.9 (16.1)	$t = -2.392$ $P = .018^{a,b}$	37.5 (26.0)	$t = .543$ $P = .588^a$	32.7 (29.5)	$t = 1.392$ $P = .165^a$	57.1 (29.0)	$t = .842$ $P = .401^a$	18.8 (12.5)	$t = -1.261$ $P = .209^a$	23.6 (20.7)	$t = -.380$ $P = .704^a$
Female	31.0 (8.3)		34.8 (15.8)		35.4 (24.5)		26.2 (29.6)		53.2 (29.2)		21.4 (13.5)		24.9 (22.2)	
<b>Age Category</b>														
<25 years	27.5 (7.1)	$F = .573$ $P = .633^c$	24.3 (19.1)	$F = 2.519$ $P = .059^c$	35.0 (17.5)	$F = 1.673$ $P = .174^c$	20 (25.8)	$F = .775$ $P = .509^c$	56.7 (27.4)	$F = .172$ $P = .915^c$	20.0 (10.5)	$F = .085$ $P = .968^c$	22.5 (24.9)	$F = .044$ $P = .988^c$
25–34 years	30.8 (8.0)		31.6 (14.4)		40.0 (26.1)		28.3 (27.8)		54.7 (29.4)		20.7 (14.2)		24.3 (19.9)	
30–50 years	31.1 (9.3)		36.4 (17.0)		36.8 (24.3)		25.3 (31.1)		52.4 (29.5)		20.5 (13.1)		24.7 (22.5)	
>50 years	30.4 (8.6)		32.9 (15.1)		30.6 (24.5)		31.3 (29.9)		55.2 (29.3)		21.5 (13.2)		25.0 (22.6)	
<b>Working experience</b>														
<2 years	26.3 (7.5)	$F = 2.316$ $P = .058^c$	27.7 (14.2)	$F = 4.501$ $P = .002^{b,c}$	40.6 (27.2)	$F = .677$ $P = .608^c$	28.1 (25.6)	$F = 378$ $P = .824^c$	37.5 (26.9)	$F = 3.497$ $P = .009^{b,c}$	18.0 (11.2)	$F = .749$ $P = .560^c$	17.2 (19.8)	$F = .628$ $P = .643^c$
3–5 years	29.0 (6.4)		25.4 (14.1)		38.7 (23.1)		25.8 (28.5)		57.0 (27.5)		20.2 (13.6)		24.2 (20.9)	
6–10 years	33.2 (8.2)		38.1 (15.2)		38.9 (26.4)		27.8 (29.3)		65.9 (29.3)		20.3 (13.7)		23.3 (20.9)	
11–20 years	30.5 (9.6)		37.0 (17.4)		33.6 (25.4)		24.6 (32.4)		49.7 (28.9)		19.7 (14.3)		26.2 (22.1)	
>20 years	31.0 (8.7)		32.6 (15.1)		33.8 (23.7)		30.5 (29.1)		53.3 (28.6)		22.7 (12.6)		25.6 (22.9)	
<b>Education</b>														
Vocational	30.5 (9.0)	$F = .109$ $P = .896^c$	32.4 (15.4)	$F = 1.248$ $P = .289^c$	33.6 (23.9)	$F = 1.984$ $P = .140^c$	28.0 (29.1)	$H = 2.626$ $P = .269^d$	54.6 (29.9)	$F = .419$ $P = .658^c$	21.8 (13.3)	$F = 2.142$ $P = .120^c$	25.0 (22.1)	$F = .864$ $P = .423^c$
Bachelor Degree	31.0 (8.1)		35.7 (16.7)		40.3 (26.2)		26.2 (30.7)		52.5 (28.0)		18.6 (13.2)		24.4 (21.4)	
Master Degree	32.2 (6.2)		28.6 (28.5)		33.3 (14.4)		50 (0.0)		66.7 (33.3)		29.2 (7.2)		8.3 (14.4)	
<b>Additional PI/Wound care training</b>														
Yes	33.7	$Z = -1.995$ $P = 0.046^{b,e}$	33.7 (14.7)	$t = .062$ $P = .950^a$	34.9 (25.3)	$Z = -1.792$ $P = .073^e$	35.7 (26.7)	$Z = -1.757$ $P = .079^e$	64.2 (23.9)	$Z = .057$ $P = .57^e$	23.7 (16.1)	$t = 1.216$ $P = .225^a$	20.5 (16.7)	$Z = .898$ $P = .369^e$
No	30.3		33.5 (16.2)		42.9 (19.1)		26.5 (29.9)		52.7 (30.0)		20.4 (12.9)		25.1 (22.4)	

Note: Bold values are significant different of knowledge between the groups. Differences were assumed significant at  $P < 0.05$  for a CI of 95%.

<sup>a</sup>Independent sample  $t$ -test.

<sup>b</sup>significant difference.

<sup>c</sup>ANOVA test.

<sup>d</sup>Mann-Whitney  $U$ -test.

<sup>e</sup>Kuskal-Wallis test.



all community nurses in Bandung who met the inclusion criteria completed the questionnaires. This group of 235 participants consisted of 80 community nursing program coordinators (34.0%) and 155 community nurses (66.0%). The majority of participants were female (77.9%;  $n = 183$ ). More than half of the participants (67%;  $n = 158$ ) were over 35 years and had more than 5 years of working experience (80%;  $n = 188$ ) as a community nurse. A total of 65.0% ( $n = 152$ ) of participants graduated from vocational nursing education. A minority of the participants (11.9%;  $n = 28$ ) received PI or wound care training. The demographic data of all participants are shown in Table 1.

### 3.2 | Knowledge of participants

Table 2 shows the percentage of correct answers on the PUKAT 2.0 for the total group, per subgroup and for each subtheme. The percentage of correct answers in the entire group of community nurses on the PUKAT 2.0 was 30.7%. This means that 69.3% of the questions were answered incorrectly. The theme “Prevention” had the lowest percentage of correct answers (20.8%) followed by the themes “Specific patient group” (24.6%) and “Risk assessment” (27.6%), respectively. The highest overall score was found in the theme “Nutrition” (54.0%).

There were no statistical differences in total scores between community nurses regardless of their background characteristics, except in the aspect of the additional training in PI or wound care. Community nurses who had additional PI training had a higher knowledge score compared with community nurses who did not have additional PI training (33.7% vs 30.3%;  $Z = -1.995$ ;  $P = 0.046$ ).

There were no differences in theme scores between community nurses when looking at age categories and educational levels. When comparing theme scores of nurses with different years of working experience as a community nurse, significant differences were found in the subthemes “Aetiology” ( $F = 4.501$ ;  $P = 0.002$ ) and “Nutrition” ( $F = 3.497$ ;  $P = 0.009$ ) with the highest score in the groups 6–20 years and 6–10 years working experience, respectively. Results for the information of the knowledge scores in total and per theme are presented in Table 2.

### 3.3 | Attitude of participants towards PI prevention

Table 3 shows the results on the attitudes questionnaire in total and per subgroup of participants. As shown in the table, the median score was 44 (range 28–55), demonstrating a positive attitude among community nurses

**TABLE 3** Participant’s attitudes towards pressure ulcer prevention for each subgroup

Participants	Total Score	
	Median (Range)	Difference
Overall	44 (28–55)	
Gender		
Male	44 (28–53)	$Z = .450$
Female	44 (30–55)	$P = .652^a$
Age Category		
<25 years	44 (39–46)	$H = 2.890$
25–34 years	44 (30–51)	$P = .409^b$
30–50 years	44 (28–53)	
>50 years	44 (32–55)	
Working experience as a community nurse		
<2 years	43.5 (38–50)	$H = 4.127$
3–5 years	44 (37–51)	$P = .389^b$
6–10 years	43 (30–52)	
11–20 years	44 (28–53)	
>20 years	44 (32–55)	
Education		
Vocational	43 (28–53)	$H = 11.773$
Bachelor degree	45 (30–55)	$P = .003^b$
Master degree	45 (44–51)	
Additional training in PI/wound care		
Yes	44 (37–50)	$Z = .403$
No	44 (28–55)	$P = .687^a$

<sup>a</sup>Mann–Whitney *U*-test.

<sup>b</sup>Kuskal–Wallis test.

towards PI prevention. Subgroup analyses showed a significant difference in attitude towards PI prevention based on educational level: the higher the education, the more positive the attitude ( $H = 11.773$ ;  $P = 0.003$ ).

When considering the individual items of the attitude scale, it appeared that the majority of community nurses (80%) agreed that “all patients (irrespective of the patient’s characteristics) are at risk of developing a PI”. Similarly, the majority of community nurses agreed that they needed to concern themselves with PI prevention in their practice (91%), that most PIs can be avoided (96%) and that continuous (96%) and regular (95%) nursing assessment of PI risk will have benefits in PI prevention. Lastly, the community nurses believed that PI prevention is a greater priority than PI treatment (90%). An overview of the community nurses’ attitude towards PI prevention is shown in Table 4.

**TABLE 4** Participant's attitudes towards pressure ulcer prevention per statements

Statements	Strongly Agree N (%)	Agree N (%)	Neither Agree nor Disagree N (%)	Disagree N (%)	Strongly Disagree N (%)
All patients are at potential risk of developing pressure injuries	42 (17.9)	140 (59.6)	13 (5.5)	35 (14.9)	5 (2.1)
Pressure injury prevention is time consuming for me to carry out	0 (0.0)	13 (5.5)	16 (6.8)	151 (64.3)	55 (23.4)
In my opinion patients tend not to get as many pressure injuries nowadays	3 (1.3)	44 (18.7)	63 (26.8)	111 (47.2)	14 (6.0)
I do not need to concern myself with pressure injury prevention in my practice	3 (1.3)	8 (3.4)	9 (3.8)	120 (51.1)	95 (40.4)
Pressure injuries treatment is a greater priority than pressure injury prevention	1 (0.4)	10 (4.3)	13 (5.5)	131 (55.7)	80 (34.0)
Continuous nursing assessment of patients will give an accurate account of their pressure injury risk	83 (35.3)	143 (60.9)	6 (2.6)	1 (0.4)	2 (0.9)
Most pressure injuries can be avoided	108 (46.0)	119 (50.6)	7 (3.0)	0 (0.0)	1 (0.4)
I am less interested in injury prevention than other aspects of nursing care	4 (1.7)	7 (3.0)	48 (20.4)	157 (66.8)	19 (8.1)
My clinical judgement is better than any pressure injury risk assessment tool available to me	1 (0.4)	40 (17.0)	84 (35.7)	103 (43.8)	7 (3.0)
In comparison with other areas of nursing care, pressure injury prevention is a low priority for me	2 (0.9)	17 (7.2)	38 (16.2)	159 (67.7)	19 (8.1)
Pressure injury risk assessment should be regularly carried out on all patients during their stay in hospital	102 (43.4)	123 (52.3)	6 (2.6)	3 (1.3)	1 (0.4)

## 4 | DISCUSSION

The objective of this study was to measure knowledge and attitudes of community nurses about PI prevention, in the capital city of West Java, a province with the highest population in Indonesia. The results showed that the nurses had considerable deficiencies in knowledge (only 30.7% of all questions were answered correctly) but, conversely, had a positive attitude towards PI prevention (median = 44; range 28–55). Many studies have reported similar results regarding knowledge deficits about PI prevention among nurses in hospitals and nursing homes.<sup>11,18-21,25-27,29</sup> A previous study from De Meyer et al (2019), using the same instrument to assess knowledge about PI prevention, reported inadequate knowledge (only 50.7% of all questions were answered correctly) among nurses and nursing assistants in 16 Belgian hospitals.<sup>18</sup> Correspondingly, Kim and Lee<sup>19</sup> and Beeckman et al<sup>11</sup> who used the earlier version of PUKAT 2.0 in their respective studies, also reported knowledge deficits among nurses in long-term care facilities in Korean and Belgian hospitals with the total correct answer 60.1% and 49.7%,

respectively.<sup>11,19</sup> In addition, studies from Charalambous et al in Cyprus,<sup>20</sup> Fulbrook et al in Australia,<sup>21</sup> Claudia et al in Canada,<sup>25</sup> Chianca et al in Brazil,<sup>26</sup> Saleh et al in Jordania<sup>27</sup> and Meesterberends et al in Netherlands and Germany,<sup>29</sup> all found knowledge deficits on PI prevention among nurses in hospital or nursing homes, irrespective of the type of instrument used to measure knowledge.

In our study, the lowest knowledge score was found in the theme 'prevention' a similar finding to the study of De Meyer et al.<sup>18</sup> Only three (1%) nurses in our study could answer the question "How should bed linen be used to prevent pressure ulcers?" correctly. Also, almost all nurses (96%; n = 226) had an incorrect understanding of the role of ring cushions (donuts); they thought that 'donuts' were effective in preventing pressure ulcers when patients are seated. But, these ring cushions are not recommended because they make the contact surface between the patient's skin and the surface smaller; thus, the pressure will be higher.<sup>1</sup> This finding echoes that of Fulbrook et al<sup>21</sup> and Charalambous et al,<sup>20</sup> suggesting a persistent confusion among nurses regarding PI prevention in the seated individual. This is reiterated in the fact

that just 14% ( $n = 34$ ) of respondents understood how repositioning prevents pressure ulcers.

Thus, even though the respondents in this study were knowledgeable in some items, e.g. in the theme “nutrition”, which reached the highest score, the overall results show that they need to increase the fundamental understanding of PI prevention. This is borne out by the fact that among individuals who had attended additional training about pressure injuries or wound care, in general, this resulted in a significant higher total knowledge score, but only at borderline value ( $Z = -1.995$ ,  $P = 0.046$ ). However, in our study we did not ask which training the community nurses received so there might be large differences in length of training. De Meyer et al also found a correlation between attending additional training with higher total knowledge score.<sup>18</sup> For this reason, carrying out training for these community nurses might be of value in increasing their knowledge of PI prevention.

In terms of attitude towards PI prevention, nurses demonstrated a positive attitude, in line with previous studies on this topic.<sup>11,12,19,20,24,32,34</sup> Moore and Price, who originally developed the questionnaire used,<sup>32</sup> found that more than 90% of hospital nurses agreed that they needed to concern themselves with PI prevention in their practice. This finding was similar in our study and in three other studies that used the same questionnaire.<sup>12,22,24</sup> Nurses in these studies believed that PIs could be avoided and they agreed that continuous and regular assessment of PI risk will have benefits in PI prevention.<sup>12,22,24,32</sup> Almost all community nurses believed that PI prevention is a greater priority than PI treatment, which is in line with the fact that prevention is indeed a priority in community health services.<sup>35,36</sup> We found that the attitude levels towards PI prevention were correlated with a higher basic education ( $H = 11.773$ ;  $P = 0.003$ ). However, this positive attitude was not correlated with either gender, age, working experience, or whether or not the nurses attended additional training in PI or wound care.

In this study, it seems that despite a positive attitude towards pressure ulcer prevention, actual PI practice may not benefit because of a lack of knowledge on the important elements of PI prevention. Further, given the consistent findings of positive attitude within the literature,<sup>37</sup> it seems prudent that a greater focus be given on providing nurses with the knowledge and skills needed to translate the positive attitude into effective prevention behaviours in practice.

#### 4.1 | Study limitations

Some study limitations should be mentioned. First, considering the fact that Indonesia is a large country, it is

unknown if the results of this study can be generalised to all Indonesian community nurses due to the different characteristics of urban and rural areas. However, the internal validity of our results is high, as the participation rate in this study was 100%, meaning that all eligible nurses invited (235 community nurses from 80 Primary Health Care in Bandung) completed the questionnaire. Further, normality test showed normal distribution of knowledge score. Another limitation of this study could be that some items in the attitude questionnaire focused on hospital patients. However, despite this, all items were evaluated by the 22 experts as relevant for community nurses. Therefore, the scores on the attitudes questionnaire give a good indication of the attitude towards PI prevention among community nurses. An important strength of this study is that this study is unique because, based on our best knowledge, this is the first study focusing on PI prevention among community nurses.

## 5 | CONCLUSION

This study shows that community nurses in a large city in Indonesia had considerable knowledge deficiencies but a positive attitude towards PI prevention. Therefore, increasing fundamental understanding on PI prevention calls for serious attention for all the community nurses and further research should focus on what nurses need to increase their knowledge on PI prevention. Furthermore, this study reports a positive attitude among nurses towards PI prevention. This is valuable for increasing their role in PI prevention among community-dwelling older adults. However, research should be conducted to explore further what community nurses need to strengthen their role in PI prevention.

#### DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available due to privacy or ethical restrictions.

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