Necessity for Research on Work Engagement of Remote Island Public Health Nurses
– Based on literature review findings for research on nursing profession work engagement and rural nursing profession turnover and retention –

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Abstract

Purpose: The turnover of public health nurses working on remote islands is presumably related to job satisfaction and work environments. To assess the importance of applying the concept of work engagement（WE）for research to investigate factors influencing the turnover of remote island public health nurses（PHN）, we review domestic and international studies of PHN' WE and trends in research investigating turnover and retention for rural nursing professionals. Methods: Using PubMed we sought and reviewed reports of WE research investigating public health nurses and Reports of turnover and retention of rural nursing professionals. Results: Reviewed Results indicate that turnover and retention of rural nursing professionals are related to personal and job resources. However, we found no report of a WE study investigating remote island PHN using the WE concept related to personal and job resources. Therefore, the actual WE of remote island PHN remains unclear. Conclusions: Clarification of the actual status of turnover among remote island PHN using the concept of WE as it relates to turnover and retention is likely to be effective as a study to obtain measures to prevent turnover among remote island PHN. Also, it can be said that this research will lead to protect the lives of island residents.

Key words: public health nurse, remote islands, retention, work engagement

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Introduction

Japan, which is said to have 14,125 islands[1], has one of the largest sea areas in the world by virtue of those islands[2]. The fundamental policy of the Remote Islands Development Act states clearly that remote islands have a key role in ensuring homeland security because of their geographical characteristics and because the lives of people living on those islands must be compensated[3]. The 17 Sustainable Development Goals adopted by the United Nations in 15[4] include "Goal 3: Ensure healthy lives and promote well-being for all at all ages." and "Goal 11: Make cities and human settlements inclusive, safe, resilient and sustainable." In this way, local communities must be sustained to protect people's health equally worldwide, whatever the environment is, and allow people to continue living where they want to live.

Moreover, the progressive decline and aging of populations and disparities among regions are regarded as challenges[5]. Maintaining and improving quality of life (QOL) in areas with restricted environments and resources, such as remote islands and rural areas, pose a universal challenge. The powerful voices of islanders who want standards of medical care to be improved suggest a need and role for the nursing profession to turn its attention to remote islands[5]. Medical and healthcare professionals on remote islands can be key persons as a valuable and reassuring presence that supports local residents.

This study specifically examines public health nurses (PHN) working in the nursing profession in local communities. Their major tasks of PHN in Japan include disease prevention, health promotion, and community development using regional characteristics[6]. Japan has worked at establishing a community-based, integrated care system for people to live in the community in which they have lived for a long time until the end of their days[7]. Great importance is assigned to the role of public health nurses as a profession to play an important role in the system[8].

However, the number of employed PHN is 55,595 in Japan. That figure remains low compared to the number of employed nurses: 1,280,911[9]. Of the employed PHN, those working full time for local governments are 38,528[10]: nearly 70 percent of employed PHN work as local government officials. The turnover rate of full-time public health nurses working for local governments is 4.7% （based on results of the 21 Survey on PHN' Activity by dividing the number of full-time PHN who left their jobs by the total number of PHN presented above）, which is not high compared to the turnover rate of full-time nurses （11.6%）[11]. Nevertheless, because burnout is an important underlying cause of the turnover of local government PHN[12], earlier reports have described that PHN are likely to have poor mental health and high job stress[13]. In addition, high turnover rates of PHN in small towns, villages, and remote islands in Okinawa Prefecture have been drawing attention[14].

Research using the concept of "work engagement" has been increasing in recent years for investigations related to burnout and job satisfaction[15]. Work engagement （hereinafter, WE） is defined as "a positive, fulfilling, work-related state of mind that is characterized by vigor, dedication, and absorption. Rather than a momentary and specific state, engagement refers to a more persistent and pervasive affective-cognitive state that is not focused on any particular object, event, individual, or behavior"[16]. In fact, WE is regarded as intimately related to burnout and job satisfaction[17]: Using the WE concept to explore details of the background and factors in the turnover of remote island PHN is important to ascertain strategies for remote island PHN in Japan and to sustain healthcare activities while regaining vigor and renewed dedication. Nevertheless, the WE concept validity and significance for research have not been clarified.

For this reason, our study reviews WE research on PHN and research trends related to turnover and retention of remote island nursing professionals. Moreover, this study assesses the value of applying the WE concept for research to explore factors contributing to the turnover of remote island public health nurses. We use "remote islands" herein, following the basic policy of the Remote Islands Development Act[3] .

Methods

1. Search and analysis methods for target documents

1) Search and analysis methods for reports describing WE research investigating public health nurses

Using PubMed, we sought documents including the term "public health nurse work engagement." Although this search was aimed at finding WE research about public health nurses, those keywords yielded only one documents. Therefore, we again searched after replacing the term with "nurse work engagement." Most of the obtained documents were related to the nursing profession. Accordingly, we consider the need and importance of WE research on public health nurses based on trends of WE research examining the nursing profession.

2) Search and analysis methods for documents describing the turnover and retention of remote island public health nurses

Again with PubMed, we sought documents using the keywords of "rural remote nurse turnover retention." No document was found. Therefore, we made another attempt after removing "turnover retention" from the first keywords.

Considering the importance of turnover and retention of remote island PHN, we examined factors affecting the turnover and retention of rural nursing professionals and future research methods.

For both 1) and 2) , original papers, review papers, and other available papers were selected as documents for analysis. However, for 2) , bulletins were included among the target documents because only a few applicable documents were found.

This paper describes the Results of the literature search for the two themes and a discussion of each theme followed by an integrated discussion of the two themes in the Overall discussion.

Results

1. Results of a literature review for WE research on the nursing profession

When searching for documents including the words "public health nurse work engagement," we found a document falling under the theme. When trying a search again after changing those words to "nurse work engagement," we obtained 1598 documents. An additional search using the added search term "review" identified 236 cases, 3 of which were of WE research on the nursing profession. They were chosen for analysis. Treating the papers reviewing the literature published by May 2020 as the latest review papers[18] , we searched for papers published during 2020–2023, except review papers, following the procedures explained above. As a result, 770 documents were found. The abstracts of those papers indicated 113 papers after those not falling under the theme were eliminated. We further eliminated studies not dealing with the WE of the nursing profession. Thereby, we selected 43 papers from those 113（Table 1）. Additionally, we collected one highly relevant paper from the cited references in key literature. Eventually, we selected 48 papers for analyses.

Although those review papers included a paper describing a profession other than nursing[19] , the research encompassed WE research in nursing and other fields. Moreover, it was the latest one among the review papers obtained as literature related to WE

Table1	List of references analyzed（published between 2020- 2023）	
No	author	objective
1	Gong et al., 2020	Demonstrate evidence that psychological empowerment becomes the mediator between trait emotional intelligence and job satisfaction and WE mediates the link between traits of emotional intelligence and job satisfaction.
2	Lyu et al., 2020	To explore the internal associations among organizational identity, psychological resilience, and nurses' work engagement by applying the job demands-resources (JD-R) model theory and structural equation model.
3	Wu et al ., 2020	Investigate how spiritual leadership influences WE through increased spiritual well-being and psychological capital.
4	Bartsch et al., 2021	Look into the relation between nurses and their WE during the second wave of the COVID-19 pandemic.
5	Bernburg et al., 2021	To investigate and describe the stress perception, sleep quality,pandemic-related worries and concerns, as well as the work engagement of outpatientnurses during the COVID-19 pandemic.
6	Cussó et al., 2021	To assess the level of work engagement of Spanish nurses during the COVID-19 pandemic.
7	Fukuzaki et al., 2021	Examine how nurses' work-life balance, job demands and resources, and organizational attachment influence nurses' WE.
8	Hara et al., 2021	Assess how the attraction of working at nursing homes and autonomous clinical judgment influence affective occupational commitment and whether WE mediates those relations.
9	Hu et al., 2021	Consider the relation between nurses' proactive personality and job performance.
10	Iglesias et al., 2021	To evaluate the work engagement, psychosocial risks, and psychological well-being of Spanish nurses, analyzing existing relationships, and their associations with self-reported mental health problems of nurses.
11	Martínez et al., 2021	Analyze relations among empathy, affect, personality, and WE components; then analyze the mediator role of variables susceptible to intervention.
12	Remegio et al., 2021	Understand nurse leaders' (NLs') professional quality of life, WE, and efforts for work.
13	Sasaki et al., 2021	To examine the effects of a newly developed smartphone-based stress management program (ABC Stress Management) on improving work engagement among hospital nurses in Vietnam, an LMIC.
14	Sawada et al., 2021	This study observed the effects of a program called Civility, Respect,and Engagement in the Workplace (CREW) on social climate and staff work engagement in a psychiatric ward of a Japanese hospital.
15	Wang et al., 2021	Measure Chinese dental nurses' efforts for work, job stress, psychological flexibility, perceived social support, and subjective well-being.
16	Wu et al., 2021	Systematically assess the interaction patterns of nurses' mental workload with more fatigue, WE, and COVID-19 exposure risks.
17	Zhang et al., 2021	Uncover both potential influencing factors and the reality of front-line nurses' work engagement.
18	Ding et al., 2022	Explore correlations between character strengths, WE, and subjective well-being in nurses.
19	Dossary ei al., 2022	To examine how nurse managers' leadership styles, work engagement, and nurses' organizational commitment are related in Saudi Arabia.
20	Hu et al., 2022	To investigate the current situation of work engagement of nurses in emergency department, and to find out the impact of psychological violence on work engagement and its impact path.
21	Jiang et al., 2022	To test a moderated mediation model that focuses on job resources mediating the relationship between organizational climate and nurse engagement in the long-term care facilities and emotional intelligence moderates this mediated relationship.
22	Matsuoka et al., 2022	Clarify the relation between subjective organizational justice and WE for nurses.
23	Mohamed et al., 2022	To assess the mattering perceptions, feelings of burnout, and work engagement during the COVID-19 outbreak.
24	Nagai et al., 2022	To examine the causal relationship between the personal and professional resources for nurses to work vigorously (PPR-N) and work engagement among nurses in the early stages of their careers, considering time as a key mediating factor.
25	Slåtten et al., 2022	Scrutinize whether WE is a key predictive factor to achieve desirable organizational goals.
26	Tang et al., 2022	investigate the interrelationship between nurses' sense of security, work engagement, and turnover intention during the normalization phase of the epidemic in China and to explore the impact of sense of security on turnover intention.
27	Topa et al., 2022	Using the concept of job crafting, provide empirical evidence of job crafting in nursing.
28	Wu et al., 2022	To investigate the effect of career identity on career success among Chinese male nurses and to examine the mediating role of work engagement in this relationship.
29	Yin et al., 2022	Find out the subgroups of WE for front-line nurses during the COVID-19 pandemic.
30	Zeng et al., 2022	Examine how nurses' intrinsic and extrinsic working motivation influence WE in long-term care (LTC) facilities.
31	Zhang et al., 2022	To study the effect of role overload, work engagement and perceived organisational support on nurses' job performance, including task performance, inter personal facilitation and job dedication.
32	Aguilar et al., 2023	This study aimed to evaluate the mediating role of self-efficacy in the relationship between resilience and stress on work engagement in Peruvian nurses.
33	Alharbi et al., 2023	To evaluate the work engagement status of registered pediatric nurses and its relationship with personal- and work-related variables in selected hospitals.
34	Forster et al., 2023	To explore which job demands and resources exert a major influence on nurse managers' work engagement.
35	Joneghani et al., 2023	To examine the role of mental health as a mediating factor in the influence of self-compassion and work engagement on ICU nurses' job performance during the COVID-19 pandemic, as well as the moderating effect of gender on all model relations.
36	Kato et al., 2023	To explore the antecedents (i.e., job crafting and nursing practice environment) and outcomes (i.e., strength-oriented care attitudes, mental health, and turnover intention) of work engagement.
37	Liu et al., 2023	To explore the relationships among social network degree centrality, job satisfaction, work engagement and organizational citizenship behavior (OCB) among nurses.
38	Ren et al., 2023	To examine the status quo and influencing factors of sleep quality and work engagement of nurses participating in COVID-19 during the post-epidemic era and to study the relationship between them.
39	Tanaka et al., 2023	To examine factors related to WE of industrial nurses from both workplace environmental and individual factors, to identify factors contributing to job satisfaction of industrial nurses.
40	Wu et al., 2023	To investigate the male nurses' engagement in nursing work and the influencing factors.
41	Xue et al., 2023	To evaluate the relationship between healthy work environment and work engagement considering the effect of psychological capital among ICU nurses.
42	Zhang et al., 2023	The mediating role of emotional disorders between conflict management styles and work engagement was explored based on constructing structural equation models in paediatric nurses.
43	Zhang et al., 2023	To compare psychological capital, job satisfaction, and work engagement among nurse specialists and general nurses during the pandemic, as well as to test the role of job satisfaction as a mediator in the association between psychological capital and work engagement among nurses, and to examine whether the underlying mechanism of the relationship between psychological capital and job satisfaction differs between nurse specialists and general nurses.

research other than nursing. For this reason, we included the paper among the target documents to assess overall trends of WE research.

1) Review papers (three documents)

(1) Research theme classification

[Job resources], [personal resources], and [outcomes] were common in two review papers as research themes for WE[18) 19). Although one document took up [organizational antecedents] and [individual antecedents] as its theme[20), we were able to perceive those antecedents respectively as [job resources] and [personal resources] based on its structure. "Teamwork" was found only in WE research on the Japanese nursing profession as a new personal resource[18). Apparently, teamwork is peculiar to Japanese cultural values[18). Other research themes included [nursing management's influence on engagement][20) and [leadership training][19), suggesting that the characteristics of nurse managers as leaders influenced WE[20). Research on leadership has tended to increase in WE research overall. By no means is it limited to nursing professionals[19).

Applying the Job Demands – Resource model (JD-R model) developed by Schaufeli et al. (2004) [16), we extracted [job demands] as a theme[18). The JD-R model comprises dual processes: The "health impairment process" explains that job demands (job stressors) engender stress responses, consequently causing health problems. The "motivational process" explains that job and personal resources influence WE, having positive attitudes[17). Many studies of WE have employed the model[18). Those falling under job demands, such as overtime work, reduced WE and therefore have negative correlation with WE[18).

(2) Trends of WE research assessing the nursing profession

Three papers represented the few longitudinal design studies which have been reported. Because WE improves in nurses' careers over time[20), the process must be

demonstrated through longitudinal design research[20). Few intervention studies have been conducted to verify what interventions are effective at improving WE[18) 20). Particularly few are intervention studies of the nursing profession in Japan[18). Intervention studies are increasingly common in recent years, including studies using "Mindfulness: paying attention on purpose, in the present moment, nonjudgmentally[21)" and "Job crafting: a process to raise the significance of work while changing one's work" [17) 19). As effective intervention methods that influence WE, findings must be increased while concurrently using longitudinal design research in future studies[19). Methods that intervene both in job resources and in personal resources are expected to increase because they are more effective [19).

2) Literature review of 43 papers published between 2020 and 2023 and one describing a WE study of public health nurses, and one describing a WE study of nurses in remote areas abroad.

Methods

Our search revealed 43 studies that were conducted of nurses. The departments to which the target nurses belonged varied, including pediatrics[22) 23), emergency departments[24), psychiatry[25), ICUs[26) and nurse leader[27) 28). Some studies targeted male nurses[29) 30). In addition to nurses, two studies targeted public health nurses[12) 31). All used an applied cross-sectional research design. The most commonly used scale to measure WE was the Utrecht Work Engagement Scale (UWES) (including the short version) developed by Schaufeli et al. (2004) [16) (43 papers).

(2) Recent trends of WE research

A distinctive feature of the papers published during 2020–2023 was that they addressed [COVID-19][32) - 42). During the worldwide COVID-19 pandemic, with wider effects starting in 2020, nurses' mental workloads[32) and psychological stress [38) increased drastically;

mental health declined[33]. Although the average WE score was moderate[34] [35] [39], it was higher than before the pandemic[34], WE scores were reported as tending to be higher[36] [40] [41]. Some reports suggested a positive association between mental workload and WE because many nurses had high WE scores despite high mental workloads, suggesting a positive association between mental workload and increased subjective fatigue and WE[32] [37]. This finding suggested that, in a crisis situation such as COVID-19, a high workload might be regarded as positively rewarding[32]. In terms of the three components of WE （vigor, dedication, and absorption）[17], differences were identified among nurses: some had a high level of "dedication"[34]; others showed high levels of "vigor" and "absorption"[35]. These differences might be attributable to differences in the research scales used and the departments in which the respondents worked[35]. Results demonstrated that different findings in terms of the elements of WE during the COVID-19 pandemic were likely to be produced by different factors including the scales used for research, the people and departments studied, national cultures, and the timing of implementation.

（3）Antecedents of WE

Factors reported as improving WE include job resources （e.g., support from bosses and co-workers and discretion over work） and personal resources （e.g., self-efficacy and optimism）[17]. These resources constitute antecedents that influence WE. Reportedly, greater abundance of job resources is related to higher levels of WE. Moreover, greater abundance of personal resources is related to higher levels of WE[17]. Consequently, for the discussions presented herein, we classified the reported antecedents into personal resources and job resources.

（i）Personal resources

Job satisfaction[36] [43] [44] [45] [46], subjective well-being[47], consistently proactive personality[48] [49], cognitive empathy[50], and psychological capital reportedly have positive correlation[26] [47] [51].

Furthermore, WE is positively associated with other detailed psychological factors in individuals, such as emotional intelligence[52] [45], which is the ability to express and manage one's own emotional reactions, psychological resilience[53] [54], which is the ability to handle stress and recover, self-compassion[33], which indicates compassion for oneself, and psychological flexibility[47]. These findings suggest the influence of an ability to manage stress within oneself as a personal resource, and that WE is linked to job satisfaction[45] and maintaining a high level of mental health[33].

（ii）Job resources

Social support[29] [47], leadership[51] [55], organizational commitment[55] [56] and affective commitment[57] have been found to share consistently positive correlation. Transformational （transformation-type） leadership, transactional （transaction-type） leadership[55], and spiritual leadership increase WE more than any other type of leadership[51]. By contrast, during the COVID-19 pandemic, leadership did not have a positive effect on WE, suggesting that other aspects of leadership might be important as a work resource during a crisis situation[37]. In addition, discomfort of personal protective equipment （PPE）, infection control, and frustration during the COVID-19 pandemic, which characterized the corona virus pandemic, were reported as having negative correlation[34].

With regard to organizational justice, only procedural justice showed positive correlation related to organizational justice[58]. This finding indicated that the fairness perceived in the organizational decision-making process was of particular importance, suggesting that managers fully informing their organizations' policies and assessment processes and listening to the opinions of individuals engender improvement of WE[58]. As described, some studies investigated a single factor related to WE in greater detail.

（iii）Outcomes of WE

Outcomes achieved by improving WE include work-related and business-related outcomes (e.g., work performance and attitude) and individual health-related outcomes (e.g., mental and physical health) [15) 17]. Burnout[28] and secondary traumatic stress[28] were found to have a negative correlation consistently as outcomes of WE in the nursing profession. The improvement of performance in nursing[34) 59], Sleep Quality[60] and quality of service care[44] were found to have a positive correlation, which was a similar finding to those of an earlier study[20]. Administrative public health nurses with scarce job resources were more likely to be in a state of burnout[12]. The only study of remote nurses we found indicated that WE scores included high levels of burnout scores, although remote nurses had high burnout scores and high occupational stress[61].

3) Discussion of a review of literature about WE research on the nursing profession

Based on 1) and 2), it is possible to discuss trends of WE research into the future nursing profession and to discuss the necessity and significance of studying PHN.

（1）WE studies examining the future of the nursing profession

As reported particularly from review papers[18) 19) 20], no longitudinal research but three intervention studies were conducted during 2020–2023 [62) 63) 64].

A recent trend of WE research is the growing movement to reconsider WE as a phenomenon that changes depending on the time and circumstances[65]. Findings demonstrating how the WE of nursing professionals has been affected and how it has changed must be improved through the accumulation of findings from increased longitudinal research and intervention research[18) 19].

As the antecedents specific to Japanese nurses were reported[18], WE varies depending on the cultural background and values of the country or region, so it is important to set the purpose, scale, and variables appropriately when conducting WE research[18) 65) 66]. Then, in interpreting the results obtained, it is necessary to consider the cultural background and values as well. We need to prevent the increasing number of nurses from leaving the nursing profession and guarantee the right to equal health for all by building on the findings of WE research in the various environments and situations in which nurses are placed.

（2）Significance of WE research of PHN

Although numerous studies have examined. WE among nurses in various settings, and according to department and gender, few WE studies of public health nurses have been reported worldwide. Research has not well developed. As "job resources" for administrative public health nurses, it is reportedly peculiar to PHN that the satisfaction gained from interpersonal support is at the core of their occupational satisfaction[67] and that disregard of the health sector and involvement with clerical staff within the organization become job demands (stressors) [67]. In light of those findings, there is a state of WE that is peculiar to PHN, derived from their operational and organizational characteristics. Clarifying the WE of PHNs under various circumstances helps elucidate factors preventing their turnover and mental health deterioration. To this end, accumulation of findings from WE studies conducted solely with PHN is necessary.

2. Results of a review of literature related to the turnover and retention of rural nursing professionals

The original purpose of this study was to review the literature from studies of remote island PHN. Nevertheless, because only three documents specifically described studies of remote islands[14) 68) 69], this report presents results of a review of the literature related to the turnover and retention of nursing professionals in rural areas.

A search conducted with the keywords

"rural remote nurse turnover retention" identified no document. After removing "turnover, retention" from those keywords, we again conducted a search, which yielded 961 documents, 146 of which were review papers. Eliminating papers with contents different from the purpose of this study left five papers. Eventually, two papers were selected for analyses after eliminating three papers for which the contents overlapped.

The target documents included bulletins[14] because only a few targeted documents were found, and because their contents accorded with our study's purpose. One review paper[14] presented discussion of the relevant literature published during 2009–2019. Using the review paper as the latest literature review found for the present study including remote islands, we then searched the literature published after 2020, which identified 10 papers. Of them, three papers were selected for analysis after eliminating one with contents different from this study's purpose. Additionally, we collected 9 highly relevant papers from the cited references in key literature and specialized books. Eventually, we selected 14 papers for analyses（Table 2）.

As a reference for analysis, we used a literature review[70] conducted to examine the factors influencing the retention of nursing professionals in rural areas, deeming it the oldest review paper we found for this study. Figure 1 presents the overall results obtained from the study as "Factors influencing the retention of rural nursing professionals."

Although the obtained documents, aside from review papers, described examinations of "rural areas" and "remote areas," we use "rural areas" for the present study by integrating those areas based on the definition of rural: "In mountainous areas, remote islands, and other areas that are not favored by traffic conditions and natural, economic, and social conditions, areas which have difficulty securing medical care and which meet the requirements for a doctorless area and areas equivalent to

it."[71]

1）Factors influencing the retention and turnover of rural nursing professionals
（1）Characteristics of rural nursing practice

A challenge that influences nurses' retention in rural nursing practice is the limited availability of resources such as drugs, specialized resources to care for patients, scarce housing resources for nursing professionals[72][73], lack of anonymity[68][72], the blurred boundary between private and work life[72], burnout[68], and difficulty obtaining opportunities for growth[68]. Practical support for distinctive nursing practice in remote areas is necessary, and support such as preceptors and access to educational opportunities are important factors that influence retention[74].

（2）Relation between job satisfaction and nurse retention rates

Reportedly, numerous studies have assessed the relation between job satisfaction and decisions about whether or not to reside in rural areas[70]. Rural nurses are more likely to leave their jobs when not satisfied with their work. The characteristics of nursing practice in rural areas influence job satisfaction. Moreover, their job satisfaction influences the duration of retention in rural areas[70]. The need for establishing some system to improve job satisfaction has been pointed out because many findings of studies have indicated that rural nurses have low job satisfaction[70].

（3）Relationship with the organization

With regard to the relation between nurses and organizations in rural areas, a lower organizational commitment is related directly to a higher probability of turnover intention[75]. Organizational commitment is defined as "an emotional attachment to an organization characterized by the sharing of the organization's values and goals, a desire to remain a member of the organization, and a willingness to exert considerable effort on behalf of the organization."[76] In addition to studies of the field of nursing, those of

Table2 Literature of literature related to the turnover and retention of rural nursing professionals

No	author	objective
1	Roberge, 2009	Consider factors influencing the retention of nurses in rural areas.
2	Mbemba et al., 2013	Integrating current evidence to the effectiveness of the intervention to promote nurses' retention in rural or remote areas, present a classification system for potential strategies for improving their retention in those areas.
3	DeValpine, 2014	To ensure the unique stories of bush Alaska nurses are preserved and told; to foster a strong bush nursing tradition; and to inform recruitment, hiring, and retention practices in remote settings.
4	Bragg et al., 2014	Find out the reasons why registered nurses leave their jobs at local hospitals in New South Wales, Australia.
5	Catherine et al., 2018	how employment and rural-living factors impacted the turnover intention of early-career, rural-based CMH professionals in their first few years of working.
6	Calleja et al., 2019	To investigate what transition support was reported for new graduate nurses to function effectively in rural and remote settings.
7	Sellers et al., 2019	The purpose of this study is to examine the unique contributions that job satisfaction, resilience, grit, engagement, and rural fit have on nurses' intention to stay in their unit for the next 6 months and intention to leave the institution in the next 3 years.
8	Zhao et al., 2019	Comparing the increase in the turnover rates of resident nurses and Aboriginal medical professionals with the costs and influences of increased use of agency nurses, quantify the relation between staffing patterns and health outcomes in remote primary care (PC) services.
9	Chinen et al., 2020	Clarify the factors and research trend of the turnover and retention of public health nurses and nurses working on remote islands and in rural areas.
10	Stewart et al., 2020	Regarding registered nurses, or nurse practitioners (RNs/NPs), and licensed practical nurses (LPN), consider the determinants of their intention to leave the nursing profession in rural and remote areas by the end of the following year
11	Chinen et al., 2021	This study aimed to clarify that taking a job and turnover reasons, the event that they want to resign their job among public health nurses on remote islands.
12	MacKay et al., 2021	Using meta-integration of systematic reviews and qualitative studies by theme, clarify the influence on the decision-making of nurses working at medical sites in rural and remote areas.
13	Nishimoto et al., 2022	Examine resilience to clinical nurses' burnout and the influence of relevant factors.
14	Tamata et al., 2022	To explore the perception of health leaders on factors affecting the shortage of nursing workforce in underserved areas in Vanuatu.

other fields have found that organizational commitment and occupational（job）satisfaction correlate significantly[77] as a psychological attachment to an organization[77]. Because nurses left their jobs when failing to readjust their values to changes in the organization's values, the blending of personal and organizational values is expected to be a strategy for retention[78].

（4）Factors influencing the length of working years

The satisfaction of rural nurses with community activities and life, including awareness as a team member, a sense of belonging to society, and their friends' presence in the community, constituted factors influencing retention in rural areas[70) 72) 79].

（5）Individual attributes and experiences as filtering factors

Even when nurses satisfy their jobs and community life, a family member's schooling, care, and other life events can constitute reasons for turnover intention[68]. Experiences of living, being raised, and training in rural areas, family members living in rural areas, and educational opportunities for family members available in rural areas served as "filtering factors" and influenced whether one chooses to continue residing in the rural area, or not [80].

2）Discussion of a review of literature related to the turnover and retention of rural nursing professionals

（1）The importance of research investigating the turnover and retention of public health nurses on remote islands

Because the turnover of rural medical professionals directly influences increases in hospital expenses and medical costs[81], it strongly influences the health of community residents. Similarly, local residents of remote islands invariably worry about health emergencies in an environment where medical, health, and welfare resources are scarce[82]. Remote islands, which present

various difficulties associated with population decline that is occurring more rapidly than on the mainland and in other rural areas[83], can serve as an example to be followed in underpopulated areas and can therefore be the subject of important research[84].

（2）Matters common to factors influencing the turnover and retention of nursing professionals in rural areas

Factors influencing the turnover and retention of nursing professionals in rural areas were classified as [Responses to tasks with diversity and responsibility] and [Adaptation to the environments peculiar to rural areas and remote islands]. Matters common to those two are personal resources and job resources[74].

（i）Responses to tasks with diversity and responsibility

For medical and healthcare services in rural areas, the workload is immense because of labor shortages. Medical care professionals are under psychological and physical stress because of responses to support of various kinds[85]. Moreover, working at tasks that are difficult to improve on remote islands influences PHN' turnover intentions[68]. To continue their occupation as nursing professionals in such an environment, a strong adventurous spirit and an optimistic perspective[86] constitute personal resources, as well as a system to support and educate individuals as an organization[87] and the blending of personal and organizational values[78] from job resources[17]. Those resources improve job satisfaction[77], leading to prevention of turnover intention[75].

（ii）Adaptation to environments peculiar to rural areas and remote islands

Some environments, such as environments with a blurred boundary between work and private life[72], are peculiar to rural areas and remote islands[70]. Even in such a negative situation, an active coping style that includes exchanges with the community and co-workers with an optimistic perspective[86] and satisfaction with the local community through a sense of belonging to society[72]

become personal resources[17] and constitute factors to adjust and settle in the community. Furthermore, because family life events influence turnover[68], organizations must establish a system to achieve individual work–life balance as a job resource[70].

Both (i) and (ii) above indicate that "personal resources" and "job resources" are the common factors influencing the turnover and retention of nursing professionals in rural areas and remote islands[74]. Therefore, those factors can be expected to be reflected in the literature describing future studies.

(iii) Future research for retention in rural areas and remote islands

When considering a concept model for the turnover and retention of nursing professionals in remote islands and rural areas, the relation between turnover and retention can be clarified by including the two aspects of work and private life[14], and by incorporating indicators that might be outcomes of job satisfaction and burnout[14]. Environments in which nursing professionals work vary with differences in the population size and social resources in rural areas and remote islands[75], which influences analysis[84]. Consequently, the definition of remote islands used for research should be considered carefully [72].

Overall discussion

Based on 1. Results of a literature review for WE research on the nursing profession and 2. Results of a review of literature related to the turnover and retention of rural nursing professionals, we discuss the importance of adopting the WE concept as research to explore turnover factors affecting PHN on remote islands.

The role of public health nurses in the local community is to promote healthy community development that is sustainable and which takes advantage of regional characteristics[6]. Consequently, community development that

secures the lives of people living on islands and which allows them to continue living without undue worry can be a duty of PHN working on remote islands. As the basic policy of the Remote Islands Development Act clearly states, remote islands assume national and citizenry roles[3]. They also serve in important roles in the administration of the country, prefectures, and municipalities[3]. For public health nurses who are specialists and administrative officers to carry out their duties for maintaining and improving residents' QOL and those for sustainable community development, they themselves must engage in healthcare activities energetically without leaving their job.

The literature reviews conducted for this study revealed the association of personal and job resources with turnover of nursing professionals in rural areas and remote islands[74]. However, no WE research has been conducted of remote island public health nurses using the WE concept, which has strong relations with personal and job resources. Because the WE study of nurses in remote areas reported differences from earlier studies[61], it is probable that the reality of WE on remote islands differs from that on the mainland. Personal and job resources of remote island public health nurses have not been clarified, or their relation to WE, or their influences on turnover and retention. A strategy for using the WE concept to prevent turnover and to retain public health nurses working on remote islands, which involves personal and job resources, can be important research to support nurses as they fulfill their duties.

Limitations of this study

The WE studies obtained for analyses in this study specifically targeting public health nurses were few: two papers. It can hardly be claimed that our search encompassed all publications because PubMed alone was used

to search the available literature. Moreover, very few reports of relevant literature have included discussion of studies of the turnover and retention of remote island public health nurses. For this reason, we inferred some factors influencing the turnover and retention of remote island PHN from studies of the turnover and retention of the nursing professionals in rural areas. Future studies must clarify the actual state of turnover and retention of remote island PHN, which was the original purpose of this study. Such studies can accumulate empirical research on those PHN, and can consider strategies for retention based on the circumstances of PHN working on remote islands today.

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