Nurses Knowledge after implementation of Self-Instructional Module Regarding the Prevention and Management Strategy of Varicose Vein: A scoping Review

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Abstract: **Contents: Varicose veins is among common vascular abnormalities across the globe. Studies reveal that approximately a quarter of the world's population is suffering from varicose veins and its related complications. Aim: The aim of study is to explore the relevant evidence on nurses' knowledge after implementation of self-Instructional Module regarding the prevention and management strategy of varicose veins. Methods: The scoping review of the relevant research findings of the nurse's knowledge after implementation of self-Instructional Module regarding varicose veins included 14 relevant studies. These studies published between 2015- 2020 were recruited from authentic databases like MEDLINE, PubMed, CINHAL. Result: The reviewed articles, founded that nurse lack of sufficient knowledge and understanding of varicose veins. The results showed that an educational program based on the Health Belief Model (HBM) and activity education on the adoption of defensive behaviors among nurses' varicose vein was effective in enhancing knowledge Conclusion: The research demonstrates that knowledge of varicose veins is poor too modest among nurses' Varicose vein is known to affect people who spend longer period working while standing.**

Keywords: **Nurses, self-Instructional Module, varicose vein.**

1. INTRODUCTION

Varicose veins (VV) refer to the distended, swollen, twisted and generally larger than 3mm and mainly seen in the lower limbs [1]. The twisting and enlargement occur in the legs and feet, followed by damaged valves so that the blood goes in the wrong direction. The swelling affects the legs more than the veins, due to the pressure exerted by walking or standing on the lower body extremities [2,3]. Individuals seek solutions for VV when they become worse or against their esthetic appearance. Their blue and dark bulges create a lumpy appearance on the limbs.

Current statistics reveal that nearly 2.7 million people worldwide, suffer from varicosities and the toll is ever increasing [4]. Moreover, the prevalence of varicose veins in the lower extremities ranges from ten to thirty percent worldwide [5]. Varicose veins affect 20 to 25 million people in the United States [1]. A study done in northern India found that 46.7% of women and 27.8% of men had varicose veins [6].

VV has different risk factors that exacerbate the prevalence of the condition. The causes and risk factors of VV varied among the general population. A positive family history, standing for long hours, marital status, age, and lifting heavy objects, increased the risks of VV development [7]. Chronic venous diseases or chronic venous insufficiency (CVI) triggered the occupational leg swelling [8]. Conversely, the general risk factors such as smoking, pregnancy, or number of childbirths and being overweight, increased the concern for VV, while shaping the subsequent therapeutic interventions.

Patients record different signs and symptoms, following the development of VV. According to [2] patients showed skin discoloration, increased pain while standing, and itching around the veins. Standing for long hours increases the aching feeling around the legs and feet [9]. Other patients reported a burning feeling, muscle cramping, swelling, and throbbing in the lower parts of their legs. Patients with underlying circulatory issues showed visible swollen blood vessels [10,3] and the swelling in the feet and ankles worsened daily.

Studies have proposed the prevention and management of VV, particularly for occupational settings that exacerbate the problem. Methods such as exercising, high fiber diets, changing sitting position, elevation of leg, and maintaining weight could prevent it [11]. Patients could manage VV with diet, physical exercise, not smoking, and sclerotherapy [12]. The pharmacological interventions for VV vary with the aggravation of the swelling [7].

Successfully prevention and management depend on knowledge to make lifestyle modifications, so that nurses can be aware of ways to prevent the occurrence of VV. I have conducted the current study to understand whether the SIM could improve the knowledge of nursing staff regarding the prevention and management strategies of VV.

2. AIM OF THE REVIEW

The aim of this review to identify and summarize empirical and theoretical evidence related to nurse's knowledge after implementation of self-instructional module regarding the prevention and management strategy of varicose veins

3. METHODOLOGY

A scoping review methodology was used to map the relevant evidence and synthesis the findings using the following steps; identifying the research question, determining the key words, inclusion and exclusion criteria, searching the databases for the relevant studies, the study selection, charting the data, collecting, summarizing the findings [13]

3.1 Research Question

The PICOT framework (Population-Intervention- Comparison- Outcome- Time) has been used to define the research question for this study.

The research question was: Among staff nurse, what is the nurse's knowledge after implementation of self-instructional module regarding the prevention and management strategy of varicose veins?

3.2 Search Strategy

A search was conducted on PubMed, CINAHL, and ScienceDirect, the electronic databases with applicable nursing literature. The search process utilized the keywords derived from the PICOT question in Table 1. The keywords included nurses, effectiveness, self-instructional module, knowledge, prevention, management strategy, and varicose veins. The keywords assisted in the search for the applicable bibliographies and studies that addressed the research question. Furthermore, the search process entailed the application of filters for a focused search. The filters were the publication dates from 2015–2020, the English language, and peer-reviewed journals.

3.3 Inclusion and Exclusion Criteria

The search and selection utilized eligibility criteria to select the most appropriate journal articles from the total derived from CINAHL, PubMed, and ScienceDirect.

Inclusion Criteria

- All articles were published in English.

- Studies adopted a quantitative study approach.

- Articles published within five years between 2015 and 2020.

- Studies that addressed the research question on the effectiveness of a SIM for nurses' knowledge for the prevention of, and management strategy for VV.

- Scholarly and peer-reviewed journals.

Exclusion Criteria

- Articles about beliefs and awareness of VV in the general population.

- Articles about VV in patients.

- Studies using other methods, such as opinions, review reports, or periodicals.

3.4 Study Selection Process

The preferred reporting items for systematic reviews and meta-analyses (PRISMA) and flow diagram in Figure 1 were used for screening the identified scholarly records from PubMed, CINAHL, and ScienceDirect. The three databases produced 203 journal articles, after implementing a varied search process. The method did not utilize other sources, such as bibliographies or grey literature to find the relevant sources for the scoping review. Following the compilation of the final records, 58 duplicate records were removed, which left 145 records. The titles and abstracts of the 145 records were assessed for relevance, which led to the exclusion of 103 articles. The screening generated 42 full-text journal articles, which were then assessed for eligibility based on the inclusion and exclusion criteria. Of the 42 full-text journal articles, 28 were excluded for failing to address the research, being older than six years, adopting a non-quantitative method, or had been published in foreign languages as opposed to English. The screening led to the inclusion of 14 journal articles for the quantitative synthesis in the scoping review. The 15 studies used different methodologies that included cross sectional study (5), pre-test post-test design (3), quasi-experimental study (1), survey (2), descriptive design (3).
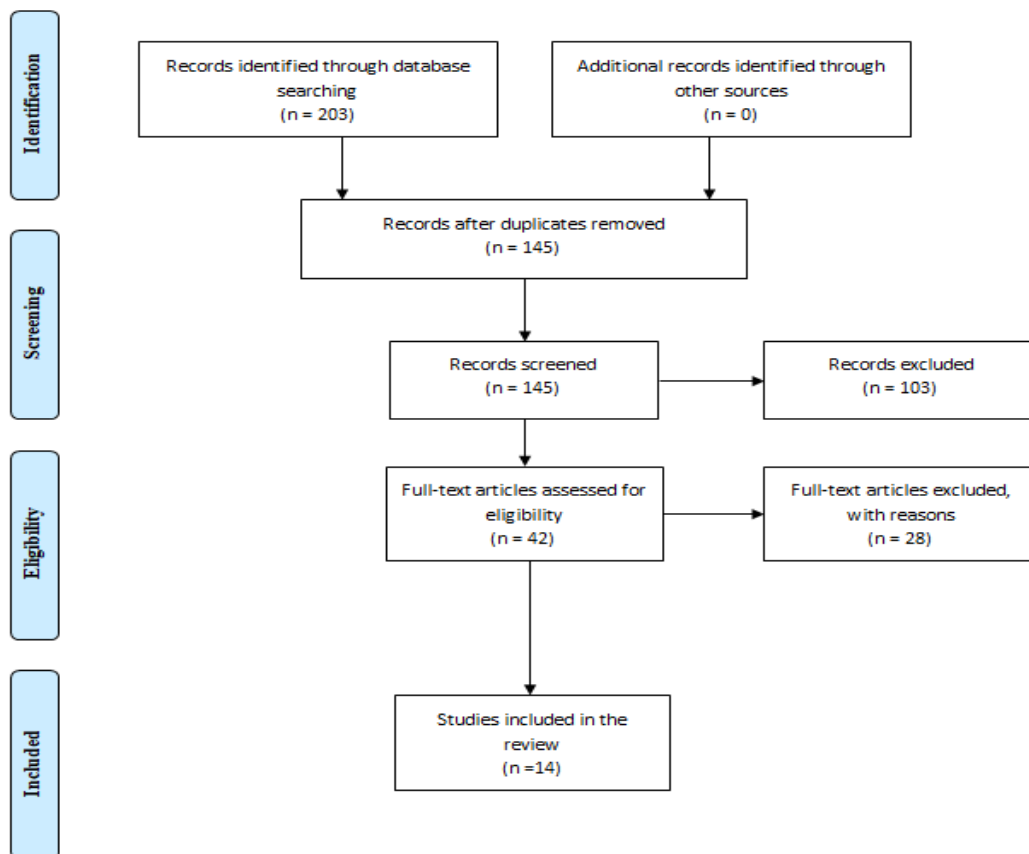
Figure 1: PRISMA Flow Diagram

3.5 Data Extraction

A data extraction table in Appendix 1 was prepared to outline the specific characteristics of the 15 studies searched through PubMed, ScienceDirect, and CINAHL. The table comprised authors and year, country of origin, sample, sampling type, research design, intervention group, control or placebo group, duration of the exposure, follow-up, measures, findings, and additional comments for each study. Each study showed limitations and overall reliability or validity in generalizing the outcomes the population of nurses who have used a SIM to expand their knowledge of the prevention of, and management strategy for varicose veins .

4. FINDINGS, RESULTS

The 15 studies adopted different quantitative methodologies, as became evident in the data extraction process. The methodologies included cross sectional studies (Babu et al., 2020; Mishra et al., 2015; Ramaswamy & Shibumon, 2016; Shakya et al., 2020; Nia et al., 2015), pre-test post-test designs (Upendrababu et al., 2018; Sebastian & Minu 2018; Shahu et al., 2020), quasi-experimental studies (Veiskarami et al., 2018), survey (Tauro et al., 2015; Yun et al., 2018), and descriptive designs (Ravindra et al., 2018; Malviya and Saji, 2018; Shadap et al., 2018). The different methodologies produced different results that helped to outline the overall knowledge of the prevention and management of VV among nurses who interacted with a SIM.

The extraction of the findings from each study was essential in determining the primary themes in the work. Each study provided a different perspective of the key themes derived through data extraction. The themes included the knowledge of prevalence and risk factors of VV, knowledge of prevention and management of VV, and effectiveness of a SIM in enhancing nurses' knowledge of the prevention of as well as the management of VV. The discussion of the themes assisted in answering the research question. The authors agreed and disagreed on critical aspects of the findings.

4.1 Theme 1: Knowledge of Prevalence and Risk Factors of Varicose Veins

The dissemination of knowledge through a well-organized instructional module enhances the preventive behaviors of the nurses against VV. [14] based their study on the health belief model (HBM) to conceptualize the formation of preventive behaviors among 100 nurses involved in a quasi-experimental study. The educational intervention through lectures, answer booklets, and questions revealed significant improvement in the understanding of VV before as well as after the sessions. The three-month intervention presented an educational program as an effective tool for building understanding of VV. However, the risk could be reduced further with self-instructional and interactive training methods through academic courses, posters, films, and conferences. [4] concurred [14] about the level of knowledge about prevalence and risk of VV among 100 nurses, following an experiment with an information booklet. While the studies varied in their settings, research design and subsequent replicability, the nurses' knowledge about VV was determined to be at 56.64%. The knowledge level varied with the experience, academic qualification, and the marital status of the participants.

According to [4], demographic variables determined the amount of knowledge of VV among the nurses under scrutiny. The source of the knowledge, experience, and marital statuses were compelling elements in the familiarity with risk factors, such as standing for long hours, child births, diet, and overweight issues. However, [5] observed that prolonged working hours and age increased the risk of VV more than other sociodemographic factors of experience did. The study noted the overall influence of occupational risks factors on the prevalence of VV, without articulating how the source of the knowledge could change the outcomes of 414 nurses. Comparatively, [15] confirmed a general awareness of the condition, despite the 225 healthcare professionals registering high prevalence and risk, due to prolonged standing, family history, as well as pregnancy. Overall, nurses acquired information about VV from training sessions or healthcare settings, shaping the development as well as risks.

Nurses had an extensive understanding of the risks of developing VV while at work. According to [16] , at least 50% of the 100 nurses working in the critical care units and other units registered, of being at high risk of VV. The risk and prevalence varied with the marital status, age, years of experience, hospitalization history, duration of night duty, and family history. The nurses gathered information from the healthcare personnel. The findings confirmed that working in the critical care units, age, experience, long hours, and sources of information shaped the overall risk of VV However,

Babu et al. (2020) noted from a cross-sectional analysis of insights from 400 nurses, that knowledge from education and other sources of information, increased familiarity with the risk factors as well as preventive behaviors. Of 400 nurses, 55.7% practiced preventive approaches to reduce the overall exposure to VV. The knowledge was essential, since [18] found occupational and demographic variables that should shape the prevention process. Insights from 203 nurses emphasized the importance of improving the quality of life of the nurses, to accommodate prolonged working hours, overtime, and body mass index (BMI).

The knowledge of the prevalence and risk factors varied with the geographical location of the nurses. [19] established risk factors of prolonged working hours as the primary cause of VV among 181 nurses. The respondents understood the value of sitting and walking, but lacked the time, due to the busy nature of the active care setting. The evaluative research of [20] was more elaborate than [19], because it found the overall moderate knowledge to be at 70%. Educational sessions were more impactful in building knowledge of prevention measures, prevalence, and risk factors; than age, experience, or residency did, contrary to the findings of [16]. The knowledge should inform the prevention and management initiatives among the nurses without proper awareness of VV. However, [1] noted that the gender, long working history, age, and family history informed the risk of VV among 364 nurses in the lower limp. The knowledge of the risk factors depended on the sources used to create awareness about the condition. Overall, nurses in different setting understood their susceptibility to VV, due to occupational and demographic risks.

4.2 Theme2: Knowledge of Prevention and Management of Varicose Veins

Nurses of different demographic groups acquired the necessary knowledge for preventing and managing VV in their work [21] established that 27% of 30 intensive care unit (ICU) nurses had an overall good knowledge. The nurses understood the importance of focusing on the right working hours, despite the time they had worked at the critical care unit. The study recommended the adoption or integration of a SIM to improve the overall knowledge of the management of VV complications, despite the research finding no significant difference between the familiarity with age, experience, gender, or shift. [19] emphasized the value of instructional methods as argued by [21], to reduce the prevalence of VV complications, while seeking better management of the prolonged standing. The knowledge was critical in encouraging the increase of physical exercises to counter the exposure of the 181 nurses to more than four hours of standing.

Sufficient knowledge among nurses fostered proper management and prevention of VV, despite the influence of demographic as well as occupational factors. [17] discovered from 400 nurses that periodic health education and subsequent health promotional sessions, would have complemented the education received on VV risk factors, prevention, and management. At least 55.7% of the respondents had a high acquaintance with practices against occupational hazards that increased the incidences of VV. However, [18] argued that proper engagement of the occupational hazards required an interventional approach against the standing for long hours, overtime work, BMI, and the long-term work experience in different settings, besides engaging nurses of different age groups and gender. Consequently, the knowledge of the prevention and management of VV should improve the quality of life of the nurses and longevity in the practice.

According to [20], better management and prevention of VV should be fostered among nurses, because it improved knowledge about risk factors as well as specific measures. The non-experimental study used a convenience sample of staff nurses working in different units. While the level of knowledge varied with age, experience, residency, and gender of the nurses, they understood from education sessions that therapies and safe travels were effective measures against VV. The educational sessions necessitated the SIM through papers, films, or conferences, to entrench effective management as well as preventive behaviors. [15] considered healthcare professionals as the primary sources of the knowledge needed to increase awareness about better occupational and lifestyle practices. The findings from the Indian perspective, ascertained the extensive role of healthcare professionals in building SIMs, to increase the general awareness of physical exercises, diet, or taking breaks, in managing or preventing VV development.

Different preventive and management measures have shown effective reduction of VV prevalence after nurses undergo educational sessions. [1] found preventive measures such as taking small breaks and wearing compression stockings were effective in preventing VV in the lower legs, despite the long hours of standing or working at the bedside of patients. While the study did not test the effectiveness of the preventive measures, the findings implied the role of creating proper

awareness of the condition. The awareness should be created through an information booklet, as became evident in another study by [22] . The information in the booklet shaped post-test knowledge of 30 nurses on the complications of prolonged standing, minimal physical exercise, or the lack of small breaks in active care settings. The findings confirmed the overall effectiveness of the SIM in disseminating knowledge of the prevention and management of VV among nurses working in different units.

4.3 Theme 3: Effectiveness of Self-Instructional Module

[14] explored the influence of education on preventive behaviors of the VV condition among nurses. They utilized a quasi-experimental study with a target sample of 100 nurses. The participants were selected and divided indiscriminately into two groups, namely case and control. The collection of data was achieved by the issuance of a self-structured questionnaire, built upon the health belief model (HBM). Data analysis was achieved using the statistical tests, chi-square, T-test, and the T-paired test.

The results established that three months after intervention, the construct of the HBM exhibited a substantial dissimilarity to a greater percentage. The mean performance score also recorded a significant improvement in the case groups of 20 to 42. The results showed that an educational program based on the HBM and activity education on the adoption of defensive behaviors among nurses' VV was effective in enhancing knowledge awareness, thus suggested to be offered in the nursing curriculum.

[22] established from a pre-test and post-test study of 30 staff nurses that the gradual improvement of the knowledge through an information booklet increased preventive behaviors. The small sample size might have affected overall representativeness of the findings to the staff nurses, but it emphasized the link between educational campaigns in preventing VV prevalence [23] agreed with [22] on the importance of creating awareness of the condition among nurses. SIMs tested among 60 staff nurses, generated high post-test knowledge about the risks of VV. The module improved the management of VV and the resilience of ICU nurses in their service delivery. A SIM comprises ready materials for nurses and health members as they engage with illustrations and evidence-based guidelines on handling the disease.

According to [24], information approaches such as video-assisted teaching were effective in building preventive and management behaviors among 60 staff nurses with VV. Of the 60 respondents, 86.7% of the nurses acquired enormous knowledge of the prevention of VV, as they understood options such as doing exercise and taking breaks.". Video-assisted teaching was a form of an instructional module that individualized the learning process on the relevant preventive measures irrespective of age, experience, work experience, or gender. However, the modules should be responsive to the specific risk factors of VV. [15] concurred on the established critical risk factors, such as a positive family history, prolonged standing, and immobilization. Knowledge fostered the adoption of the medical treatment and therapies against VV within the nursing occupational environment.

[16] agreed on the general importance of educating critical care nurses on the VV conditions to prevent as well as manage it. Overall, self-instructional sessions within the healthcare environment were effective in entrenching prevention and management behaviors to reduce the overall risk of VV.

5. CONCLUSION

The review of the 15 journal articles derived from PubMed, CINAHL, and ScienceDirect, revealed the overall acknowledgment of prevalence and risk of VV among staff nurses. Nurses in different settings are prone to developing the conditions due to their age, family history of VV, prolonged working hours, being overweight, working at the bedside without taking rest, an unhealthy BMI and a history of VV-related surgeries. The wide knowledge about the prevalence and risk factors informs the development of preventive and proper management behaviors to reduce or eliminate VV complications. However, the knowledge must come through SIMs, such as papers, conferences, informational booklets, films, and posters within the healthcare environment. The review confirmed the effectiveness of SIMs in disseminating the facts needed to manage and prevent VV incidences among staff nurses. Further studies should explore the specific SIMs, such as conferences or posters, in preventing VV through a randomized controlled trial, involving different healthcare institutions.

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APPENDIX - A

Appendix I: Data Extraction Table

Study Reference	Country of Study	Total Sample	Study Design	Type of Participants	Intervention Group	Control/Placebo/Comparison Group	Duration of Intervention	Follow Up	Outcome Measures	Main Findings	Additional Comments
Babu et al. (2020)	India	400	Cross-sectional study	Staff nurses	Not applicable	Not applicable	Not applicable	Not applicable	Knowledge and practices surrounding the prevention of VV.	Of the sample, 41% was aged 21–25, 48% acquired good and excellent knowledge of VV prevention, and 55.7% of the participants acquired better practices through education."	The findings are generalizable and applicable to the staff nurses seeking to prevent VV at work.
Malviya and Saji (2018)	India	30	Descriptive study	ICU nurses	Not applicable	Not applicable	Not applicable	Not applicable	Knowledge of VV and management.	Age, gender, marital status, education, previous work, working hours, and years of experience, did not influence the knowledge of VV. Nurses had adequate knowledge of the risks derived from educational sessions.	Small sample size affected the overall generalizability of the findings to other ICU nurses.
Mishra et al. (2015)	India	364	Survey	Nurses working in general wards	Not applicable	Not applicable	Not applicable	Not applicable	Prevalence of lower limb VV.	Female nurses had higher prevalence rate than male counterparts. Longer work history, long working hours, age, and family history increased VV risk.	The findings are applicable to nurses working in different settings.
Nia et al. (2015)	Iran	203	Cross-sectional study	Nurses from three general hospitals	Not applicable	Not applicable	Not applicable	Not applicable	Occupational and demographic factors defining the risk of VV among nurses.	The prevalence of VV was 72.4%. Female nurses recorded a higher prevalence than male nurses, with 77.8% and 56.9% respectively. Non-interventional risks included age, years of service, prolonged working hours, overtime, and BMI.	The study should have included a randomization aspect to enhance generalizability to the three Iranian hospitals.
Ramaswamy and Shibumon (2015)	India	225	Cross-sectional study	Healthcare professionals	Not applicable	Not applicable	Not applicable	Not applicable	Prevalence of VV among healthcare professionals.	Of the healthcare professionals studied, 28% suffered from VV." Nurses had a higher risk than doctors, due to family history, prolonged standing, and pregnancies.	The study outcomes were transferable to the nurses and doctors seeking awareness of the prevention of VV.

Ravindra et al. (2018)	India	60	Evaluative research with non-experimental descriptive design	Convenience sample of 60 nurses	Not applicable	Not applicable	Not applicable	Not applicable	Knowledge of risk factors and preventive measures against VV.	Educational sessions increased the nurses' knowledge of the preventive measures against VV.	The generalizability of the findings was low, due to a small sample size.
Sebastian and Minu (2018)	India	60	Pre-test post-test design	Convenience sample of staff nurses	Not applicable	Not applicable	Video-assisted teaching	Not applicable	Educational program through video-assisted teaching on knowledge of VV among staff nurses.	Nurses registered high post-test knowledge of VV and its risk factors, after attending an educational session with video-assisted teaching	The small sample size affected applicability of the outcomes. Randomization would have enhanced the replicability of the methods.
Shadap et al. (2018)	India	100	Non-experimental descriptive research design	Convenience sample of 100 nurses in critical care units	Not applicable	Not applicable	Not applicable	Not applicable	Assessing the risk of VV in critical care units.	Nurses in the critical care units registered ahigher risk of developing VV than the nurses working in the other units. Age, female gender, marital status, experience, and hours worked increased the risk of VV.	The study enhances comparability by presenting the critical care unit as a riskier occupational setting for VV than other units.
Shahu et al. (2020)	India	60	Pre-test post-test research design	Purposive sampling technique staff nurses	30 nurses in SIM	Normal engagement sessions	Seven days	Not applicable	The SIM as a tool to improve knowledge of staff nurses.	The post-test findings revealed the effectiveness of the SIM, following a high knowledge score value among the staff nurses. They expressed high intentions of adopting preventive and management of VV.	The purposive sampling reduced bias in the study and enhanced an objective sample.
Shakya et al. (2020)	Nepal	181	Cross-sectional study	Female nurses	Not applicable	Not applicable	Not applicable	Not applicable	The prevalence and risk factors of the VV among female nurses	VV was prevalent among the female nurses, due to prolonged hours and limited time to walk and sit.	Including female nurses in the study, created a biased sample that downplayed the generalizability of the findings to the staff in critical care or general units
Tauro et al. (2015)	India	100	Descriptive survey	Purposive sample of staff nurses	Not applicable	Not applicable	Not applicable	Not applicable	Using an information booklet to disseminate knowledge of the risks and preventive measures against VV.	At least 10% of the respondents recorded good knowledge, while 26% had average knowledge. There was good knowledge overall with 59.64% of the respondents confirming the value of the information booklet in understanding VV.	The non-probability nature of the sampling introduced a level of bias in the study.
Upendrababu et al. (2018)	Ethiopia	30 staff nurses	Pre-test post-test design	Staff nurses	Informational booklet	Not applicable	Seven days	Not applicable	Role of informational booklet in building preventive measures against VV	Staff nurses benefited from an informational booklet to enhance their prevention behaviors against VV.	A sample size of 30 staff nurses was non-representative.
Veiskarami et al. (2018(	Iran	100	Quasi-experimental study	Random sample of nurses	Twenty nurses underwent educational intervention through lectures, questions, and answer booklets.	Basic knowledge of VV	Three months	Not applicable	Educational approach based on HBM to enhance preventive measures against VV.	Educational intervention increased preventive measures such as physical exercise.	The SIM should have included interventions through academic posters, films, conferences, and training, through academic courses.
Yun et al. (2018)	South Korea	414	Questionnaire survey	Staff nurses working at a university hospital.	Not applicable	Not applicable	Not applicable	Not applicable	Prevalence and risk factors of VV among nurses.	There was a low prevalence rate of 16.18% among the nurses working at the university hospital. Risk factors included pregnancy, delivery, standing for long periods, and age.	The large sample size increased the representativeness of the outcomes to other nurses working in different units.