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# Advancing physical activity management in nursing: a systematic literature review on educational interventions and technology integration

Avanzando la gestión de la actividad física en enfermería: una revisión sistemática de la literatura sobre intervenciones educativas e integración tecnológica

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**Abstract.** Introduction: This systematic literature review (SLR) aims to critically examine the role of nurses in promoting physical activity through educational interventions and the integration of technology. Method: This systematic review was conducted across multiple databases, including PubMed, CINAHL, Scopus, Cochrane Library, Web of Science, and Google Scholar. Result: The SLR finds that behavior change interventions, such as the use of pedometers and self-liberation techniques, along with simulation-based learning and scenario-based approaches, significantly increase patient activity levels, self-efficacy, and knowledge of lifestyle modification among patients with chronic condition. Conclusion: The review highlights the importance of systemic changes like better resource allocation, streamlined workflows, and supportive policies to empower nurses to prioritize physical activity education in their responsibilities, ultimately enhancing patient care and outcomes.
**Keywords:** Humans, Actigraphy, Self-efficacy, Lifestyle, Exercise, Patient Care, Technology

**Resumen.** Introducción: Esta revisión sistemática de la literatura (RSL) tiene como objetivo examinar críticamente el papel de las enfermeras en la promoción de la actividad física a través de intervenciones educativas y la integración de la tecnología. Método: Esta revisión sistemática se llevó a cabo en múltiples bases de datos, incluidas PubMed, CINAHL, Scopus, Cochrane Library, Web of Science y Google Scholar. Resultado: La RSL encuentra que las intervenciones de cambio de comportamiento, como el uso de podómetros y técnicas de auto-liberación, junto con el aprendizaje basado en simulación y enfoques basados en escenarios, aumentan significativamente los niveles de actividad de los pacientes, la autoeficacia y el conocimiento de la modificación del estilo de vida entre los pacientes con condiciones crónicas. Conclusión: La revisión destaca la importancia de cambios sistémicos como una mejor asignación de recursos, flujos de trabajo simplificados y políticas de apoyo para empoderar a las enfermeras a priorizar la educación sobre actividad física en sus responsabilidades, mejorando en última instancia la atención y los resultados de los pacientes.
**Palabras clave:** Humanos, Actigrafía, Autoeficacia, Estilo de Vida, Ejercicio, Atención al Paciente, Tecnología

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## Introduction

Patient education in family health nursing is pivotal in addressing chronic diseases like obesity, cardiovascular diseases, and diabetes by promoting self-management and healthy lifestyle choices. Studies have shown that interventions based on the knowledge, belief, and behavior model significantly enhance self-management abilities, satisfaction, and compliance in elderly patients with chronic obstructive pulmonary disease (COPD) (Hosseinzadeh et al., 2022). Additionally, involving support persons in diabetes management through structured programs like Family Support for Health Action (FAM-ACT) can lead to improved patient outcomes, including better HbA1c levels and self-management behaviors (Todorova, 2022). Moreover, studies highlight the need of focusing on both health literacy and patient activation to improve outcomes in managing chronic diseases, with patients who have low health literacy benefiting the most from interventions (Hu et al., 2022). Patients who are knowledgeable about their health are more inclined to participate in physical activity, follow treatment programs (Yunus et al., 2024) and have better health outcomes. This emphasizes the crucial importance of patient education in the field of family health nursing (Yusuf et al., 2024) The importance of patient education in family health nursing has been acknowledged, but, there is a significant gap in the structured and personalized approach to teaching methods. Patient education is the process of influencing patient behaviour with using a combination method such as teaching, counselling and behaviour modification techniques to increasing the knowledge and maintain or improve health. Patient education is one way of communication between patient and nurses, which provides the necessary knowledge for enhancing patient care and potentially affecting their health outcomes (Majid, 2020). To address these barriers, strategies such as establishing dedicated patient education rooms in hospitals have been proposed, which can provide a conducive environment for personalized education sessions and improve patient satisfaction and self-care skills (Sarkhani & Beykmirza, 2022). Conventional approaches frequently fail to adequately address the unique needs of individual patients, leading to less than optimal involvement and results (Changsieng et al., 2023; Falcão et al., 2023). Nevertheless, the integration of advanced educational methods such as simulation-based learning and behavior modification frameworks has potential in improving the efficacy of patient education, specifically in the context of maintaining physical activity (Pedersen et al., 2022). These new approaches can help bridge the existing gap by offering more interactive and customized educational experiences that meet the individual needs of patients, ultimately resulting

in enhanced engagement and improved health results (Edmiston et al., 2023).

Nurses have a vital role in applying advanced educational methods in healthcare environments, implementing frameworks such as the Behaviour Change Wheel (BCW) and simulation-based learning to deliver personalized education that responds to the specific needs of each patient, and encouraging significant improvements to behavior. Research studies have shown that nurse-led interventions that include advanced strategies can effectively increase patients' physical activity levels and enhance their ability to control their own health. This leads to better health outcomes (Freeley et al., 2022; Murray, 2018; Premkumar et al., 2022; Setiyawati et al., 2023). Nurses play a crucial role in ensuring the sustainability of healthcare systems. To effectively navigate the changing healthcare landscape and provide excellent care, nurses need to develop responsive technological skills and critical thinking abilities. This highlights the significance of ongoing education and skill improvement in a digital health system.

This systematic literature review aims to critically examine the role of nurses in implementing these structured, systematic, and individualized education processes. By synthesizing current research on advanced patient education techniques, this review seeks to highlight the effectiveness of these interventions and provide recommendations for integrating them into family health nursing practice. Ultimately, the goal is to empower nurses to enhance patient outcomes through innovative and personalized educational strategies, thereby advancing the field of physical activity management in chronic disease care.

## Method

This systematic review was conducted following the Preferred Reporting Items for Systematic Reviews (PRISMA) guidelines

### *Study Design*

*Selection Criteria*

The selection criteria for inclusion and exclusion in a study might include:

The selection criteria for inclusion and exclusion in this systematic review were meticulously defined to ensure the relevance, validity, and quality of the included studies.

Inclusion Criteria:

1. Population:

a. Studies involving registered nurses, nursing students, or nurse practitioners.

b. Patients of all age groups receiving care from nurses.

2. Interventions:

a. Educational interventions focused on physical activity promotion (e.g., simulation-based learning, scenario-based approaches).

b. Use of technology in promoting physical activity (e.g., wearable technology, gamification, digital competence development).

3. Outcomes:

a. Studies measuring physical activity levels, self-efficacy, patient engagement, or health outcomes related to physical activity.

b. Studies evaluating the effectiveness of educational interventions or technology integration in nursing practice.

4. Study Design:

a. Randomized controlled trials (RCTs), quasi-experimental studies, cohort studies, cross-sectional studies, and qualitative studies.

5. Publication Type:

a. Peer-reviewed journal articles, conference papers, and dissertations.

b. Articles published in English.

6. Time Frame:

a. Studies published within the last 10 years.

Exclusion Criteria:

1. Population:

a. Studies not involving nurses or nursing students.

b. Studies focusing solely on other healthcare professionals without including nurses.

2. Interventions:

a. Interventions unrelated to physical activity promotion.

b. Studies not involving educational interventions or technology integration.

3. Outcomes:

a. Studies not measuring relevant outcomes such as physical activity levels, self-efficacy, patient engagement, or health outcomes.

b. Studies focusing solely on theoretical frameworks without empirical data.

4. Study Design:

a. Case reports, commentaries, editorials, and opinion pieces.

b. Studies with significant methodological flaws or lacking rigorous analysis.

5. Publication Type:

a. Non-peer-reviewed sources, such as magazine articles, blog posts, and news reports.

b. Articles not available in English.

6. Time Frame:

a. Studies published more than 10 years ago.

By strictly adhering to these inclusion and exclusion criteria, the systematic review aimed to select articles that added significant value to the understanding of the topic under investigation while maintaining methodological rigor and integrity.

### *Search Strategy*

The search strategy for this systematic literature review will be conducted across multiple databases, including Pub-

Med, CINAHL, Scopus, Cochrane Library, Web of Science, and Google Scholar. The main search terms will focus on four key concepts: nursing, physical activity, educational interventions, and technology integration. Keywords and MeSH (Medical Subject Headings) terms related to these concepts will be combined using Boolean operators (AND, OR). For example, the search string for PubMed might include terms such as "Nurses," "Physical Activity," "Educational Interventions," "Simulation-Based Learning," "Technology Integration," and "Patient Engagement." The initial search will involve identifying and selecting relevant articles by screening titles and abstracts based on predefined inclusion and exclusion criteria.

Once the initial search is completed, full-text articles of potentially relevant studies will be reviewed. Additionally, a manual search of reference lists of included studies will be conducted to identify any further relevant articles. This process will ensure a comprehensive literature review. All search strategies and results will be meticulously documented, including databases searched, search terms used, and the number of articles retrieved. The aim is to create a systematic and thorough approach to identifying pertinent literature on the role of nurses in promoting physical activity through educational interventions and technology integration.

### *Data Extraction and Quality Assessment*

Data extraction will be performed systematically using a standardized form to ensure consistency and comprehensiveness across all included studies. Key data items to be extracted include study characteristics (author, year, country, design, sample size, population), intervention details (description of the educational intervention, technology used, duration, setting), outcomes measured (physical activity levels, self-efficacy, patient engagement, health outcomes), and results (key findings, statistical significance, limitations). Additionally, information on funding sources and conflicts of interest will be collected. This detailed extraction process will help to systematically capture and organize the relevant information needed for the review.

Quality assessment of the included studies will be conducted using appropriate standardized tools to evaluate the methodological rigor. Randomized Controlled Trials (RCTs) will be assessed using the Cochrane Risk of Bias Tool, focusing on domains such as sequence generation, allocation concealment, and blinding. Observational studies will be evaluated using the Newcastle-Ottawa Scale (NOS), examining selection of study groups, comparability, and outcome assessment. Qualitative studies will be reviewed with the Critical Appraisal Skills Programme (CASP) checklist, considering study aims, methodology, data collection, ethical considerations, and data analysis. Each study will be independently assessed by two reviewers, with discrepancies resolved through discussion or consultation with a third reviewer. The quality ratings will inform the interpretation of findings and the overall strength of the evidence (Figure 1).

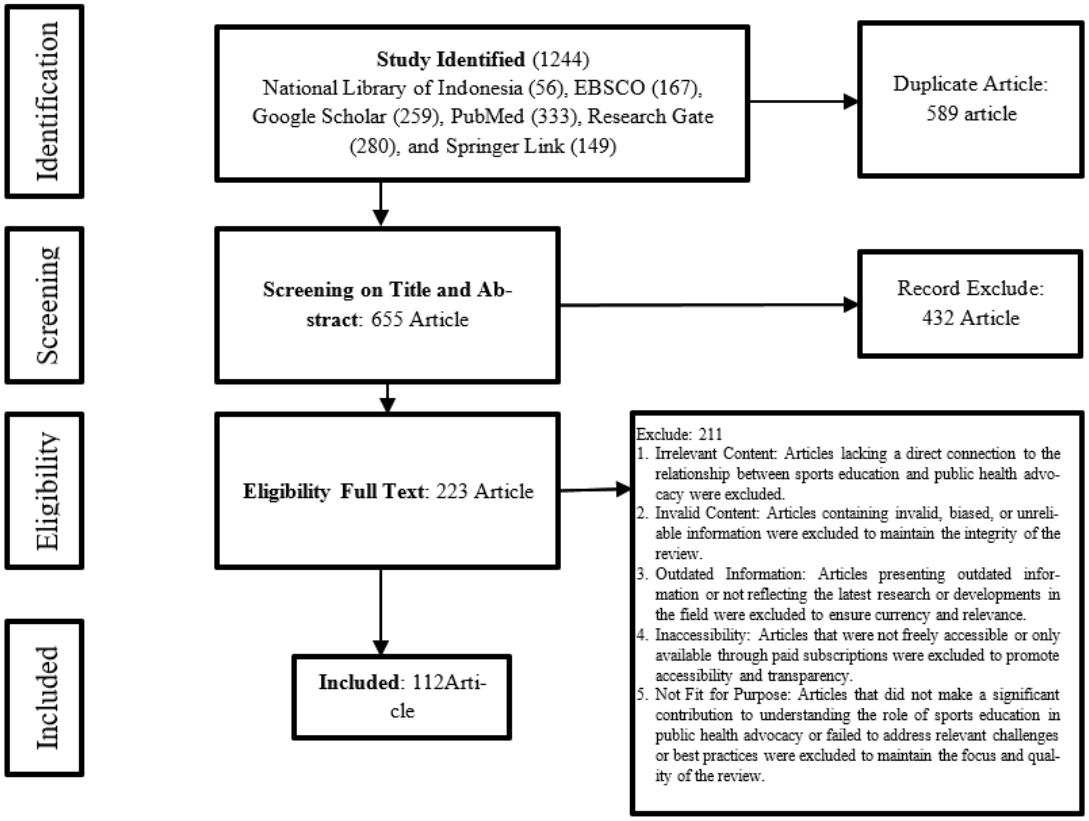


Figure 1. Flow Chart for Study based on PRISMA Guidelines

2025, Retos, 62, 827-836


## Result

The review of twelve journals highlights the multifaceted role of nurses in promoting physical activity, emphasizing the integration of technology, patient engagement, education, and overcoming barriers to implementation.

Table 1.
Summaries of Physical Activity Management in Nursing

| No | Author | Method/Design | Sample | Intervention/Procedures | Findings |
|---|---|---|---|---|---|
| 1 | Westland et al., (2018)<br><br>Patients' experiences with a behaviour change intervention to enhance physical activity in primary care: A mixed methods study. | mixed methods design, RCT trial was conducted alongside the study to assess the effectiveness of the intervention | 67 patients who are at risk for cardiovascular disease in primary care | Setting: Primary Care<br>Intervention: Activate intervention, nurse-led consultations that integrate 17 Behavior Change Techniques (BCTs), focuses on enhancing patients' motivation, goal-setting, self-monitoring, and problem-solving skills to facilitate long-term engagement in physical activity | Patients experienced the Activate intervention as valuable for increasing and maintaining their physical activity. The use of self-monitoring tools such as accelerometers and activity logs was perceived as very helpful by patients |
| 2 | (Vetrovsky et al., 2018)<br><br>A pedometer-based walking intervention with and without email counseling in general practice | RCT,<br>A Qualitative study was conducted alongside the study to assess the effectiveness of the intervention | 10 overweight and obese patients | Setting: Primary Care<br>Intervention: 12-week pedometer intervention, using a pedometer to track participants' daily steps and receiving email counseling where participants received guidance, motivation, and feedback from nurses | The intervention was effective in helping participants become more aware of their physical activity levels and provided valuable insights into their experiences, perceptions, and the effectiveness of different behavior change techniques in increasing physical activity |
| 3 | (Lee et al., 2015)<br><br>The Effects of Nursing Interventions Utilizing Serious Games That Promote Health Activities on the Health Behaviors of Seniors | a quasi-experimental design | 15 Hypertension Patients | Setting: Welfare Center<br>Intervention: Serious health game designed specifically for seniors, included physical exercise sessions and educational content on health-related topics,the participants engaged in the health game twice a week for a duration of 12 weeks | The intervention using a serious health game significantly improved seniors' health beliefs, concerns, attitudes towards health behaviors, perceived behavioral control, perceived ease of use, and intentions to perform health behaviors. Physical measures, including flexibility, blood pressure, and pulse, showed that seniors' physical abilities remained stable or partially improved. |
| 4. | (Xu et al., 2023)<br><br>Smartphone-based gamification intervention to increase physical activity participation among patients with coronary heart disease: A randomized controlled trial | RCT | 108 Coronary heart disease patients | Setting: Community<br>Intervention: smartphone-based gamification, was delivered through a WeChat applet, consists of elements such as points, leaderboards, progress bars, and badges into a non-game context to make physical activity more engaging and motivating for patients | Participants using the WeChat applet with step goal setting and gamification elements significantly increased their average daily steps, higher levels of competence, autonomous motivation, and experienced notable improvements in physical health metrics such as weight, BMI, and waist circumference compared to the control group |
| 5 | (Ohlsson-Nevo et al., 2020)<br><br>In the hands of nurses: A focus group study of how nurses perceive and promote inpatients' needs for physical activity | Qualitative Descriptive Design: | 29 Clinical Nurses | Setting: Hospital | Overall themes highlight the critical role of nurses and the hospital environment in promoting physical activity among inpatients, emphasizing the need for a supportive, collaborative, and well-resourced approach to patient care |
| 6. | (Edmiston et al., 2023)<br><br>Making the Case for a Change in Patient Education Techniques: Moving Toward Scenario and Simulation-Based Approaches | Descriptive | General Chronic Disease Patients<br><br>N= not specified | Setting: healthcare environment<br>Intervention: the use of simulation-based education techniques to teach patients how to manage their chronic diseases and engage in physical activities more effectively in- | Simulation-based education significantly improves the management of chronic diseases by enabling patients to practice real-life scenarios. Patients who engage in simulation-based learning report high satisfaction, demonstrate better health outcomes, and benefit from reduced hospital readmissions. |

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|---|---|---|---|---|---|
| | | | | stead of traditional methods (transfer knowledge only) | |
| 7. | (Roberts et al., 2019)<br><br>Cancer specialist nurses' perspectives of physical activity promotion and the potential role of physical activity apps in cancer care. | Semi-structured, in-depth interviews | Clinical Nurse Specialists (CNSs)<br><br>N=19 | Setting: Clinical Setting | The themes emerged from the study highlite the challenges such as limited time and resources. CNSs use personalized advice, goal setting, and motivational support to encourage physical activity, while recognizing the need for a broader system of support. Smartphone apps show promise in enhancing access to physical activity resources and support, though their integration into healthcare requires careful planning. |
| 8. | (Bēta, 2014)<br><br>Patient Education – Relevance in Nursing Education and Practice | Qualitative Study | Nurses who were involved in patient education and had voluntarily attended a formal education course<br><br>N= 140 self-reflecting papers | Setting: healthcare setting Procedure: A total of 140 graduation papers, which included self-reflections on a patient education case study, were selected at random. | The study found that nurses primarily rely on verbal methods for patient education, which are less effective due to the lack of interactive elements and deeper engagement, and rarely use discussions, electronic resources, or empathetic feedback. This approach results in a significant knowledge-practice gap and patient information deficiencies, highlighting the need for more practical skills, technology-enhanced, and interactive methods in nursing education |
| 9. | (Riera-Sampol et al., 2021)<br><br>Effectiveness of physical activity prescription by primary care nurses using health assets: A randomized controlled trial. | RCT | 263 participants who had two or more cardiovascular risk factors | Setting: primary healthcare centers Intervention: four visits, a motivational interview, and an individualized physical activity prescription based on health assets, aiming to increase their adherence to the recommended 150 minutes of physical activity per week. | The study found that a multifactorial intervention by primary care nurses increased adherence to the recommended 150 minutes of physical activity per week and led to more time spent walking among participants, though it did not increase overall physical activity levels. Despite this, the intervention proved feasible and practical for primary healthcare settings, making it an effective method to promote regular exercise and potentially reduce cardiovascular risk. |
| 10 | (Furlan et al., 2019)<br><br>Evaluation of an innovative tele-education intervention in chronic pain management for primary care clinicians practicing in underserved areas. | pre-post study | 264 primary care healthcare providers | Setting: primary healthcare centers Intervention: ECHO (Extension for Community Healthcare Outcomes) Intervention delivered by using a tele-education model designed to improve healthcare providers' knowledge and skills, particularly in managing complex health conditions like chronic pain, by using case-based learning and interactive sessions | ECHO tele-education intervention enhances knowledge and skills of healthcare providers and improves chronic pain management for primary care healthcare providers including nurse practitioners in underserved areas. |
| 11 | (Melariri et al., 2022)<br><br>An assessment of nurses' participation in Health Promotion: a knowledge, perception, and practice perspective | Cross-Sectional | 184 nurses | Settting: Tertiary Hospital | Based on the analysis, the study concluded that nurses' knowledge and perceptions of physical activity health promotion significantly influence their practice, and recommended that physical activity health promotion be well incorporated into nursing education and ongoing training |
| 12 | (Dwinger et al., 2020)<br><br>Effects of telephone-based health coaching on patient-reported outcomes and health behavior change: A randomized controlled trial | RCT | 4283 patients with chronic condition | Setting: Intervention: Health coaching provided over the phone from trained nurse, based on three main techniques: motivational interviewing, goal setting, and shared decision-making | The study found that telephone-based health coaching (TBHC) significantly increased physical activity, reduced BMI, and improved health literacy and patient activation compared to the control group. TBHC also led to more frequent blood pressure monitoring but had no significant impact on mental health, alcohol consumption, smoking, or medication adherence. |

Here's a table summarizing the themes and sub-themes from the systematic literature review (SLR) on the role of nurses in promoting physical activity through educational interventions and technology integration:

Table 2.
The Themes and sub-themes from systematic review

| No | Theme | Sub-Theme |
|---|---|---|
| 1 | Role of Nurses in Physical Activity Promotion | - Behavior change interventions (e.g., use of pedometers, self-liberation techniques) |
| 2 | Educational Interventions | - Simulation-based learning |
| | | - Scenario-based approaches |
| 3 | Integration of Technology | - Development of digital competence |
| | | - Use of wearable technology |
| | | - Gamification |
| 4 | Patient Engagement and Outcomes | - Real-time feedback |
| | | - Health care partnership |
| 5 | Challenges Faced by Nurses | - Limited resources |
| | | - Competing clinical demands |
| 6 | Importance of Physical Activity Education | - Integration into routine practice |
| 7 | Telerehabilitation Programs | - Management of chronic diseases |
| | | - Improvement of quality of life and self-care |
| 8 | Barriers to Implementation | - Lack of time |
| | | - Lack of expertise |
| | | - Lack of referral pathways |
| 9 | Strategies for Effective Integration | - Adoption of quality standards for consumer devices |
| | | - Seamless data integration into electronic health records |
| | | - Adequate resources and training for nurses |
| 10 | Nurses' Role in Health Promotion | - Enhancing patient self-management |
| | | - Implementing evidence-based strategies |

This table captures the main themes and sub-themes discussed in the SLR, providing a clear overview of the various aspects related to the role of nurses in promoting physical activity.

## Discusion

This systematic literature review (SLR) assesses the contribution of nurses in encouraging physical activity through educational interventions and the integration of technology. The review concludes that behavior modification interventions, such as the use of pedometers, have a substantial impact on increasing patient activity levels and self-confidence. Simulation-based learning and scenario-based approaches are crucial for cultivating digital competence in nurses, hence improving their efficacy in encouraging physical activity. Wearable technology and the use of game elements enhance patient involvement and results, while telerehabilitation programs efficiently handle long-term illnesses and enhance the overall well-being. In order to overcome challenges such as limited resources and lack of understanding, it is recommended to adopt high-quality standards for consumer devices, ensure smooth integration of data, and offer adequate training for nurses. The systematic literature review (SLR) highlights that behavior modification interventions, led by nurses, such as the use of pedometers and self-liberation strategies, significantly increase patients' levels of physical activity and self-confidence. Nurses play a crucial role in promoting physical activity and conducting interventions to encourage behavior change, ultimately leading to improved health outcomes for patients. Research indicates that using tools like pedometers and self-liberation tactics can significantly improve both physical activity levels and self-efficacy in individuals, particularly among nurses in the workforce (Bartosiewicz & Łuszczki, 2023; Bressington et al., 2018). Nurses can successfully influence patients to adopt healthier lifestyles, thereby increasing adherence to physical activity and improving overall physical and mental well-being.

(Mahrous & Aboelmagd, 2022; Mills, 2023), through the provision of personalized guidance and ongoing assistance. Nurses, through their unique patient relationships, have the capacity to encourage regular physical activity, thereby assisting in the prevention of noncommunicable illnesses and the improvement of community health . The researchers assert that nurses can exert a pivotal influence on promoting regular physical activity and improving overall health outcomes by leveraging their unique patient interactions.

The systematic literature review (SLR) determines that wearable technology and gamification show potential as effective methods for enhancing patient engagement and improving physical activity outcomes. This is achieved through the provision of real-time feedback and the promotion of a collaborative healthcare relationship between patients and providers. The review highlights the significance The application of simulation-based learning and scenario-based techniques in nurse education is crucial for the development of digital competence and the effortless integration of digital technologies into clinical practice. Educational interventions in nurse education are essential for the development of nurses' digital competencies and the integration of digital tools into clinical practice (Chaisurin et al., 2023). Simulation-based learning and scenario-based approaches are emphasized as crucial strategies for training nurses to proficiently use technology in order to enhance physical activity, ultimately resulting in more effective promotion of physical activity (Jobst et al., 2022; Shorey & Ng, 2021). Wearable technology and gamification have been recognized as effective methods for promoting patient engagement and improving physical activity results. They offer real-time feedback and help strengthen the collaboration between patients and healthcare practitioners (Liu et al., 2023; Wang et al., 2023).

These technologies have shown to increase motivation and adherence to physical activity programs, emphasizing the importance of integrating them into nursing practice to enhance patient self-management and promote active lifestyles (Hehman et al., 2023). Continuous technological advancements and training for nurses are recommended to ensure successful integration of these digital

tools into healthcare practices (Chaharsoughi et al., 2022). The researchers suggest that incorporating these digital tools into nursing practice can enhance patient self-management and promote a more active lifestyle, emphasizing the need for continuous technological advancements and training for nurses. The researchers believe that enhancing nurse education with these methods will better equip nurses to engage patients and utilize digital interventions, ultimately leading to more effective physical activity promotion.

The finding significance of discussing physical activity with cancer patients, yet they encounter obstacles like limited self-efficacy and resources, alongside competing clinical demands, hindering effective promotion of physical activity in routine practice (Gildea et al., 2023; Toohey et al., 2023; Voland et al., 2023). These challenges are further supported by a systematic review that identified healthcare professional-related, patient-related, and organizational-related barriers to providing cancer pain management, emphasizing the need for systemic changes to address these issues (Ehrman, 2022). Moreover, a study focusing on hematopoietic stem cell transplantation patients highlighted barriers such as knowledge limitations and inadequate support, suggesting tailored prehabilitation interventions and the inclusion of exercise professionals in care teams to overcome these challenges (Hirschey et al., 2023; Purdy et al., 2023). Addressing these barriers necessitates systemic changes like better resource allocation, streamlined workflows, and supportive policies to empower nurses to prioritize physical activity education in their clinical responsibilities, ultimately enhancing patient care and outcomes. he researchers argue that addressing these barriers requires systemic changes, including better resource allocation, streamlined workflows, and supportive policies to enable nurses to prioritize physical activity education in their clinical duties

To enhance the efficacy of physical activity interventions and fully harness the potential of digital health technologies in promoting physical activity among patients, adopting quality standards for consumer devices, ensuring seamless data integration into electronic health records, and providing adequate resources and training for nurses are crucial strategies (Eccleston, 2023; Shah et al., 2022). These strategies align with previous research emphasizing the importance of technology integration in healthcare to drive a patient-centered, cost-effective, and efficient model of care (Ibrahim et al., 2022; Kouroubali & Katehakis, 2022). Addressing challenges such as interoperability, security, and privacy of patient information is essential to reduce information silos and ensure the effective use of digital health technologies in integrated care models (Carter & Ford, 2023; Pant et al., 2022). To maximize the effectiveness of digital health technologies in promoting physical activity interventions, it is crucial to adopt a unified approach that involves healthcare professionals, legislators, and technology developers. This collaborative effort is essential for overcoming existing obstacles and optimizing the impact of these technologies (Dempsey et al., 2022; Lim et al., 2021; Westland et al., 2019). The researchers assert that a unified strategy combining healthcare professionals, politicians, and technology developers is crucial to overcome existing obstacles and fully use the capabilities of digital health technologies in encouraging physical activity among patients.

The systematic literature review has certain limitations that necessitate acknowledgment. Firstly, the search technique is restricted to articles published in English, which may exclude relevant research published in other languages. This language bias could lead to a limited comprehension of the worldwide extent of nursing interventions and the incorporation of technology in promoting physical activity. Furthermore, the review is limited to studies published during the past decade, potentially excluding influential publications that have significantly influenced the current knowledge but were published before to this timeframe. In addition, the criteria for inclusion prioritize peer-reviewed journal articles, conference papers, and dissertations, potentially excluding useful insights from grey literature such as policy reports, organizational recommendations, and expert opinions.

## Conclusion

The current literature review emphasizes the crucial role of nurses in encouraging physical activity through several educational interventions and the use of technology. The results suggest that implementing behavior modification interventions, such as the use of pedometers and self-liberation techniques, in addition to simulation-based learning and scenario-based approaches, effectively increase both physical activity levels and self-efficacy in patients. Combining wearable technology and gamification enhances patient involvement and improves outcomes. Notwithstanding these progressions, obstacles such as scarcity of resources, conflicting clinical requirements, and impediments to execution endure.

The implications of these findings for nursing practice and the broader community are significant. The integration of digital technologies and educational strategies into the practice of nurses not only improves their capacity to encourage and assist patients, but also promotes a more proactive and preventive approach to healthcare. Enhanced physical activity levels among patients can have positive effects on overall health outcomes, resulting in lower healthcare expenses and an improved quality of life for the community. The progress made highlights the crucial importance of nurses in promoting health and preventing diseases.

Future research should prioritize addressing the mentioned obstacles by investigating innovative ways to easily combine physical activity promotion into regular nursing practice. Furthermore, it is necessary to conduct research to examine the lasting impact of these interventions on patient health outcomes. Additionally, it is crucial to explore the possibilities of emerging technologies in order to further improve nurse-led health promotion initiatives. In order to

generate strategies and recommendations that may be globally applied, it is crucial to incorporate varied populations and contexts in future study.

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