REVISIONES

Interventions for Prostate-Specific Antigen Testing: A Rapid Literature Review

Intervenciones hacia la Prueba de Antígeno Prostático: Una revisión rápida de literatura

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ABSTRACT:
Objective: To identify the best available evidence related to interventions for the acceptance of the prostate-specific antigen test.
Methodology: Rapid literature review following the steps established by Tapia-Benavente, which are: 1.- research question, for which the PICO structure limited to the definition of the problem, intervention, and result was used; 2.- bibliography search in recognized databases; 3.- study selection and data extraction; 4.- bias risk assessment, for which the CONSORT group clinical trial verification guidelines were used; and 5.- preparation of a summary and conclusion of the evidence found.
Results: The rapid literature search yielded a total of 51 publications from three databases, PubMed (27), EBSCO (13), and SCOPUS (11); 11 of which met the inclusion criteria. One hundred percent of the studies indicated a significant difference between the experimental and control groups ($p < .05$). The most frequently used strategies included home visits, conferences, group discussions, brainstorming, question-and-answer dynamics with slides, as well as the use of educational brochures, and were carried out in a period of one day and up to six months.
Conclusions: There is an evident knowledge gap in the development and implementation of strategies for Prostate Cancer prevention behavior directed to indigenous men, as well as a lack of nursing intervention models focused on this disease.

Keywords: Randomized Clinical Trial; prostate cancer; Prevention; Intervention

RESUMEN:
Objetivo: Identificar la mejor evidencia disponible relacionada a las intervenciones dirigidas hacia la aceptación de la prueba de antígeno prostático.

Metodología: Revisión rápida de literatura, siguiendo los pasos establecidos por Tapia-Benavente, los cuales son: 1.- pregunta de investigación, para lo cual se utilizó la estructura PICO acotada a la definición del problema, intervención y resultado; 2.- búsqueda de bibliografía en bases de datos reconocidas; 3.- selección de estudios y extracción de datos; 4.- evaluación del riesgo de sesgo, para lo cual se utilizó la guía de comprobación de ensayos clínicos del grupo CONSORT; y 5.- la elaboración de la síntesis además de la conclusión de la evidencia encontrada.

Resultados: La búsqueda rápida de literatura arrojó un total de 51 publicaciones de tres bases de datos, PubMed (27), EBSCO (13) y SCOPUS (11); de los cuales 11 cumplían con los criterios de inclusión. El 100% de los estudios indican un cambio significativo entre el grupo experimental y control (p < .05). Las estrategias más utilizadas incluyen la visita domiciliaria, conferencias, debates en grupo, lluvia de ideas, dinámicas de pregunta y respuesta con diapositivas, así como presentación de folletos educativos, mismos que se ejecutan en un periodo de un día, hasta seis meses.

Conclusiones: Se hace evidente el vacío de conocimiento referente al desarrollo e implementación de estrategias para abordar la conducta de prevención relacionada al Cancer de Próstata hacia varones de pueblos originarios, así como la falta de modelos de intervención de enfermería enfocadas en este padecimiento.

Palabras-clave: Ensayo Clínico Aleatorizado; Cancer de Próstata; Prevención; Intervención

INTRODUCTION

According to the World Health Organization, 1,414,259 people were diagnosed with prostate cancer (PCa) in 2020 [1], making it the leading cause of death among men over 50 years of age worldwide [2]. This situation is no different in Mexico, since it was considered the deadliest disease in 2022, with 9.8 deaths per 100 thousand men and an approximate catastrophic expenditure of 2,218 dollars [4].

In this sense, diagnostic methods, such as digital rectal examination (DRE) and Prostate-Specific Antigen (PSA) testing, are important for the early detection of PCa, as well as for the development of health interventions with the purpose of not only contributing to the knowledge related to PCa, but also to the acceptance and application of these detection tests.

Studies focused on the evaluation of health interventions mention that the application of educational intervention programs with public health or pedagogical models are usually effective [5-7]. However, it has also been found that the main obstacles are lack of cultural adaptation and the long duration of the interventions, which does not align with the availability of the target population. It has also been recommended that diagnostic tests should be offered during the interventions, and the tests should be quick and with flexible hours [8,9].

Considering the above, it is necessary to identify the best available evidence related to interventions for the acceptance of the prostate-specific antigen test, in addition to the fact that, thus far, there is no literature review to serve as a guide for adequate and effective strategies for health professionals to better approach this topic. This leads to the following research question: What is the best available evidence related to interventions for the acceptance of the prostate-specific antigen test?

METHODOLOGY

A rapid literature review was conducted following the steps established by Tapia-Benavente et al.,[10], which are: 1.- research question, for which the PICO structure limited to the definition of the problem, the intervention, and the result was used; 2.- a

search of bibliography from 2016 to 2022 in recognized databases such as EBSCO, SCOPUS, and PubMed using a search string with Boolean operators (AND, OR) and health science descriptors (HSDe) (Table 1). 3.- study selection and data extraction, using the following inclusion criteria: full-text, open-access research papers in English or Spanish with results limited to the acceptance or non-acceptance of the prostate-specific antigen test, and the following exclusion criteria: duplicate articles, theses, dissertations, and studies that did not fit the objective of the present study; it should be noted that the reference manager Mendeley was used to store and organize the publications found; 4.- bias risk assessment using the CONSORT group clinical trial verification guidelines [11], which consist of 22 questions divided into four sections: a) title and abstract, b) introduction, c) methods, and d) results and discussion, as well as a flow diagram that can be used by authors, editors, reviewers, and readers to improve the quality of reporting of randomized clinical trials; and 5.- preparation of a summary and conclusion of the evidence found.

Table 1: Search string

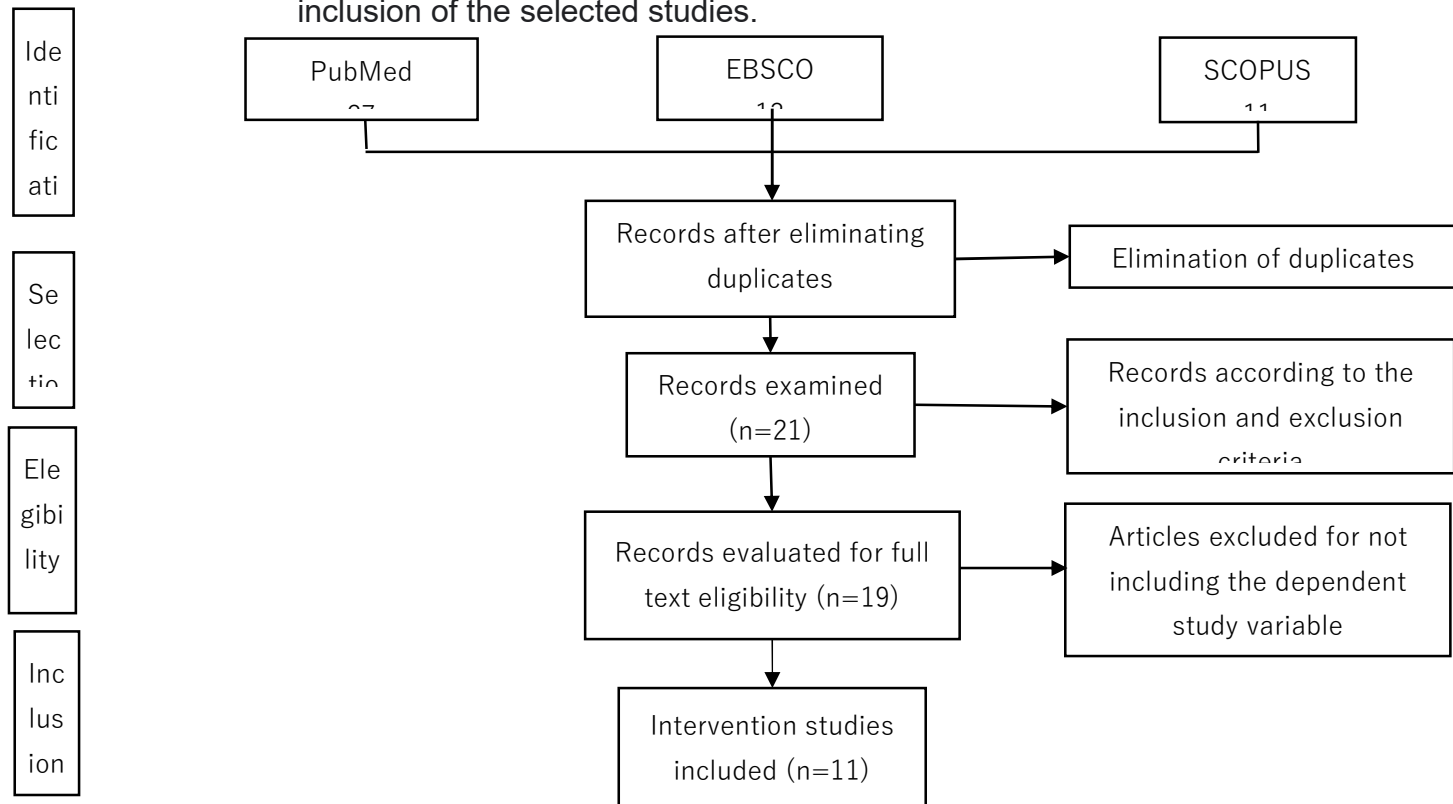| Randomized clinical trial AND prostate cancer AND prevention; intervention AND Nursing AND prostatic neoplasm OR Prostate cancer AND educational program AND level of knowledge AND intention to screen OR Prostate cancer AND intervention AND prostate specific antigen |
| --- |

Source: created by the authors

RESULTS

Search results

The rapid literature search yielded a total of 51 publications from three databases, PubMed (27), EBSCO (13), and SCOPUS (11), no older than ten years after conducting the study and after the elimination of duplicates. In the title selection by relevance (studies of interventions for PCa in any location), 30 studies were excluded, which resulted in a total of 21 full texts evaluated. After applying the quality criteria, eight studies were excluded for not specifying the intervention design or clarifying the type of screening performed, and they also did not include the dependent study variable. Finally, a total of 11 studies were used for the literature review (Figure 1).

Figure 1: PRISMA flow diagram [12] for a systematic review of the literature and the inclusion of the selected studies.

| PubMed | EBSCO | SCOPUS |

Records after eliminating duplicates → Elimination of duplicates

Records examined (n=21) → Records according to the inclusion and exclusion criteria

Records evaluated for full text eligibility (n=19) → Articles excluded for not including the dependent study variable

Intervention studies included (n=11)

Identificati

Selectio

Elegibility

Inclusion

Source: Created by the authors, based on the PRISMA Statement

Characteristics of the studies

The 11 studies used were conducted in countries from Asia (Iraq, Iran, and Jordan), Africa (Kenya), Europe (United Kingdom), and America (Cuba and Venezuela), which was where the incident rates of PCa were the highest (111.6 and 97.2 cases per 100,000 men, respectively) [13], while the lowest occurred in the Asian countries (4.5 to 10.5 cases per 100,000 men). The studies were published in international journals with a high impact factor such as Journal of the American Medical Association, Asian Pacific Journal of Cancer Prevention, International Journal of Community-Based Nursing and Midwifery, and International Journal of Preventive Medicine (Table 1).

Table 1: Characteristics of the selected studies.

Author	Country	Journal	IF
Abhar et al. [14]	Iran	International Quarterly of Community Health Education	0.92
Mbugua et al. [15]	Kenya	Advances in Preventive Medicine	1.7
Hidalgo et al. [16]	Venezuela	Jornada virtual de medicina familiar en ciego de Ávila	S/R

Saleh et al. [17]	Jordan	Asian Pacific Journal of Cancer Prevention	2.06
Rezaei et al. [18]	Iran	International Journal of Preventive Medicine	2.12
Martin et al. [19]	United Kingdom	Journal of the American Medical Association	14.89
Smith et al. [20]	Cuba	I Congreso Virtual de Ciencias Básicas Biomédicas de Granma	S/R
Jeihooni et al. [21]	Iraq	Journal of Cancer Education	1.771
Pérez et al. [22]	Cuba	Revista Archivo Médico de Camagüey	S/R
Molazem et al. [23]	Iran	Asian Pacific Journal of Cancer Prevention	2.06
Ghodsbin et al. [24]	Iran	International Journal of Community-Based Nursing and Midwifery	2.53

Note: IF= Impact Factor.

Based on the characteristics of the selected studies that focus on interventions for the acceptance of the prostate-specific antigen test, there was increased focus on non-modifiable factors such as age, family history, and race or ethnic group. Therefore, the aim of prevention efforts was for men to get the PSA test from the age of 40 with the purpose of decreasing the mortality rate in the target population. This emphasizes the importance of the interventions, which generated significant differences between experimental and control groups ($p< .05$) and resulted in more than 50% of subjects agreeing to take the PSA test, which was related to an increase in the knowledge ($p<.05$) about risk factors, signs, and symptoms. This was achieved through strategies such as home visits, conferences, group debates, brainstorming, question-and-answer dynamics with slides, and the use of educational brochures, which were carried out in a period of one day and up to six months. Of the studies selected, eight corresponded to a quasi-experimental design [14-17,20-23] and three to a randomized clinical trial [18,19,24], and were based on different reference frameworks, with the PRECEDE-PROCEED Model being the most frequently used in these studies, followed by the Health Belief Model [14,24] and the Theory of Planned Behavior [18]. It should be noted that five studies did not mention any reference framework and did not report any PCa information at the beginning of the intervention [15,17,19, 22,23] (Table 2).

Table 2: Characteristics of the interventions in the selected studies.

Author	Population	Design	Reference Framework	Strategy	Duration	Result
Abhar et al. [14]	80 men aged 40, with an experimental (n = 40) and a control (n = 40) group.	Quasi-experimental	Health Belief Model	Conferences, group debates, brainstorming, question-and-answer	Six sessions during three months	Significant differences between the two groups (p < .05), and 52.5% agreed to get the PSA test
Mbugua et al. [15]	288 men aged 40 to 69	Quasi-experimental	N/R	Home visit	Six months	Awareness about PCa (p<.05); knowledge (p<.05); PCa screening increased from 4.5% to 20.4% (p < .05)
Hidalgo et al. [16]	48 men aged 50 and over	Quasi-experimental	PRECEDE-PROCEED Model	Creation two groups with 24 patients, in addition to having a meeting	Twice a week for five weeks	Increase in knowledge about risk factors of 98.5%; about symptoms of 100%; and increase in agreement to get the PSA test of 29.2%
Saleh et al. [17]	154 men aged 40 and over	Quasi-experimental	N/R	Conference, group discussion, and brochure	A one-hour session	Statistically significant results of knowledge (p<.001) and intention to get screened (p<.001)
Rezaei et al. [18]	68 middle-aged men (30 to 59 years)	Randomized clinical trial	Theory of Planned Behavior	Theory based program	Four sessions twice a week for two months	None of the subjects from the control group had a prostate screening, whereas 33.2% of the 68 subjects from the experimental group got a PSA test (p < 0.001)
Martin et al. [19]	419,582 men aged 50 to 69	Randomized clinical trial	N/R	Clinic appointment where information was provided and PSA tests were offered	One day	Men with PSA levels of 3.0 ng/mL or higher were offered to have a biopsy, which allowed the identification of

						more PCa tumors and thus there was a decrease in mortality rate compared to the control group (p<.05)
Smith et al. [20]	30 over 40 years old	Quasi-experimental	PRECEDE-PROCEED Model	Educational intervention	Six months	Increase in knowledge level from 13.3% to 80% and only 62.9% had a prostate screening
Jeihooni et al. [21]	300 men aged 40 to 70	Quasi-experimental	PRECEDE Educational Model	Group discussions, brainstorming, and question-and-answer meetings	Ten sessions of 55 to 60 minutes	A significant increase (p<.05) in PCa screening attitude and behavior
Pérez et al. [22]	54 patients aged 40 to 60	Quasi-experimental	N/R	Promotion and education actions	Three months	Increase in knowledge related to clinical manifestations (from 28.2% to 87.9%), diagnosis (from 43.6% to 92.3%), and prevention (from 23.1% to 100%). Apart from getting the PSA test
Molazem et al. [23]	93 men over 50 years old, experimental (n=48) and control (n=45) group	Quasi-experimental	N/R	Film, slides, educational brochures	Before and 3 months after the intervention in two-hour sessions	An increase in the number subjects getting the PSA test in the experimental group from 6.12% to 36.4%, and knowledge increased 2.69 points after the intervention (p<0,05)
Ghodsbin et al. [24]	210 Iranian men aged 50 to 70, experimental (n=93) and control (n=87) group	Randomized controlled trial	Health Belief Model	Brainstorming, CD, and slides	Three months	Benefits increased significantly after the intervention (p>.05), participation in the PSA test in the intervention group

					increased from 7.5% to 24% in one month and to 43.3% three months after the intervention

Note: N/R= No Reference

The qualitative assessment of the selected studies based on the CONSORT group clinical trial verification guidelines showed that most of the studies complied with the requirements for the abstract and introduction, based on the scientific and epidemiological background of the disease and the objectives and rationale of the project. However, in the case of the methods, Hidalgo et al., [16] and Martin et al., [19] did not include a description of the design, details to allow replication, an explanation of any interim analyses and stopping guidelines, and who generated the random allocation sequence of the participants in the interventions, including a description of the similarity of interventions and changes to the methods after trial commencement, as well as methods for additional analyses. In the case of the results, the studies by Smith et al. [20]; Ghodsbin et al. [24]; Abhar et al. [14]; Mbugua et al. [15]; Saleh et al. [17]; Jeihooni et al. [21], and Molazem et al. [23] did not include the dates defining the periods of recruitment and follow-up. The studies by Martin et al. [19] and Hidalgo et al. [6] did not specify the demographic and clinical characteristics of each group (intervention and control), and the studies by Abhar et al. [15] and Martin et al. [16] did not include subgroup analyses, distinguishing pre-specified from exploratory.

In the case of the discussion, the studies by Molazem et al. [23] and Smith et al. [20] did not clarify the limitations, sources of potential bias, and possible generalization (external validity and applicability) of the trial findings. Finally, the studies by Smith et al. [20]; Hidalgo et al. [16], and Jeihooni et al. [21] did not include the data of where the full trial protocol can be accessed (Table 3).

Table 3: Qualitative assessment of the selected studies based on the CONSORT group clinical trial verification guidelines

Author	Title and Abstract	Introduction	Methods	Results	Discussion
Abhar et al. [14]	C	C	C	NC	C
Mbugua et al. [15]	C	C	C	NC	C
Hidalgo et al. [16]	C	C	NC	NC	NC
Saleh et al. [17]	C	C	NC	NC	C
Rezaei et al. [18]	C	C	C	NC	C
Martin et al. [19]	C	C	NC	NC	C
Smith et al. [20]	C	C	NC	NC	NC
Jeihooni	C	C	NC	NC	C

et al. [21]					
Pérez et al. [22]	C	C	NC	NC	C
Molazem et al. [23]	C	C	NC	NC	C
Ghodsbin et al. [24]	C	C	NC	NC	C

Note: C: Compliant; NC= Not compliant

DISCUSSION

The present study aimed to identify the best available evidence related to interventions for the acceptance of the prostate-specific antigen (PSA) test, and the results showed that most studies used a quasi-experimental design without a control group [15-17,20,22]. The studies were based on different reference frameworks, with the most frequently used being the PRECEDE-PROCEED methodological approach [16,20,21] followed by the Health Belief Model [14,24]. Five studies did not use any reference framework and did not mention who generated the random allocation sequence of the participants in the groups [15,17,19, 22,23], which does not allow an interpretation in terms of the selection and implementation of the interventions in order to improve health-promoting behaviors.

The above also complicates the replication of this type of studies. However, this has not been a limitation for the development of strategies by health professionals or for the creation of intervention models for the acceptance of the PSA test.

In the case of the characteristics of the male subjects, the results agree with existing data showing that men are the least concerned and have a low level of preventive health behaviors [8], which may lead to an increase in cases of PCa and other diseases that, if not detected in time, may cause serious complications in the quality of life of individuals. Given this situation, one may also question the lack of focus on indigenous men, which would imply, rather than an ideological challenge, an opportunity to promote responsible preventive health behaviors without invading their beliefs and customs.

The barriers that prevent men from deciding to have a prostate screening exam were observed as a concept involving beliefs that interfere with knowledge and preventive behavior related to PCa. This includes variables such as age, religion, education, stigmas of being a macho man, the quality of the information, and the care given by the health staff [14,24], and can contribute to a decrease in preventive behavior.

The influence of non-modifiable factors on behavioral change is highly important, since it was found in all 11 studies, and thus prevention efforts aim to encourage men to get the PSA test from the age of 40 in order to have an early detection and avoid possible complications.

It was also found that families may or may not favor the responsibility of PCa prevention behaviors [15,23], which should be considered in future interventions. In the case of acceptance of the PSA test, all research studies showed that more than 50% of men got tested after the intervention, which was related to increased knowledge

about the risk factors and symptomatology of the disease (p<.05) [15-17,20,22,23] through strategies such as home visits [15,23], conferences [14,17], and group debates [14,17,21].

It is important to mention that there are notable differences in the approach to this health problem in each country, since the health education provided by health workers during health promotion on the awareness, knowledge, perception, and acceptance of prostate screening is mostly carried out outside of the cultural context, with unsuitable language, and at inflexible hours [17,18]. This situation has, on the one hand, resulted in poor knowledge about PCa in the male population and, on the other hand, set back the acceptance and application of prostate screenings, increasing thus the number of clinical cases with delayed treatment.

Finally, these results indicate that knowledge should be provided and improved in order to counteract existing stigmas that prevent the application of PCa detection tests. This can be done through the creation of intervention models that promote a culture of responsible prevention and that will help to reduce prevalence rates related to PCa.

CONCLUSIONS

The rapid literature review carried out in the present study showed the knowledge gaps that exist in the development and implementation of strategies that address PCa prevention behavior in indigenous men, as well as the lack of nursing intervention models focused on this disease. This situation shows the need to guide the practice of promoting, managing, and addressing the professional care of these groups, taking into account barriers that discourage men from getting a prostate screening, knowledge related to PCa, and family support.

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