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ORIGINAL ARTICLE

Analysis of community understanding of the diagnosis of cervical cancer: A cohort study

Análisis de la comprensión en la comunidad sobre el diagnóstico del cáncer cervical: Un estudio de cohorte

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Abstract

Cervical cancer continues to represent a significant public health problem, particularly in contexts where timely diagnosis and preventive strategies have limited coverage. The aim of this study was to analyze the level of understanding among the female community regarding the diagnosis, risk factors, and early detection strategies for cervical cancer. A prospective cohort study was conducted in a sample of 100 women over 18 years of age, residents of the municipalities of Tampico and Ciudad Madero, Tamaulipas, without formal training in health sciences. Data were collected through a structured online questionnaire that assessed general knowledge, risk factors, preventive practices, and personal medical history. The results revealed a moderate overall level of knowledge, with notable deficiencies in specific diagnostic aspects, particularly in the recognition of combined HPV testing and cytology. Relevant differences were identified according to age group, with higher levels of knowledge observed among young adult women and lower levels among women over 55 years of age. These findings highlight the need to strengthen community-based educational strategies aimed at promoting timely diagnosis, prevention, and effective communication between healthcare services and the population

Keywords: cervical cancer; human papillomavirus; early diagnosis; screening; community knowledge

Resumen

El cáncer cervical continúa representando un problema relevante de salud pública, particularmente en contextos donde el diagnóstico oportuno y las estrategias preventivas muestran una cobertura limitada. El presente estudio tuvo como finalidad analizar el nivel de comprensión en la comunidad femenina sobre el diagnóstico, los factores de riesgo y las estrategias de detección temprana del cáncer cervical. Se llevó a cabo un estudio de cohorte prospectivo en una muestra de 100 mujeres mayores de 18 años, residentes de los municipios de Tampico y Ciudad Madero, Tamaulipas, sin formación en ciencias de la salud. La recolección de datos se realizó mediante un cuestionario estructurado aplicado en línea, el cual evaluó conocimientos generales, factores de riesgo, prácticas preventivas y antecedentes personales. Los resultados evidenciaron un nivel de conocimiento global moderado, con deficiencias importantes en aspectos diagnósticos específicos, particularmente en el reconocimiento de la prueba conjunta para VPH y citología. Se identificaron diferencias relevantes según el grupo etario, observándose mayor conocimiento en mujeres adultas jóvenes y menor comprensión en mujeres mayores de 55 años. Los hallazgos resaltan la necesidad de fortalecer estrategias educativas comunitarias orientadas a la promoción del diagnóstico oportuno, la prevención y la comunicación efectiva entre los servicios de salud y la población.

Palabras clave: cáncer cervical; virus del papiloma humano; diagnóstico oportuno; tamizaje; conocimiento comunitario

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INTRODUCTION

Cervical cancer remains one of the leading public health challenges worldwide, despite being a largely preventable disease and potentially curable when detected at early stages. According to recent estimates, it ranks as the fourth most common cancer among women globally, with a disproportionate burden in low- and middle-income countries, where the majority of incident cases and related deaths occur. This unequal distribution reflects profound disparities in access to human papillomavirus (HPV) vaccination programs, timely screening strategies, and adequate treatment services, as well as the influence of social and structural determinants that limit effective disease prevention (World Health Organization, 2025).

Scientific evidence has consistently established persistent infection with high-risk HPV as the primary cause of cervical cancer, particularly genotypes 16 and 18, which are responsible for most cases of squamous cell carcinoma and adenocarcinoma of the cervix. However, progression from viral infection to precursor lesions and invasive cancer is neither linear nor inevitable, but rather depends on the interaction of multiple biological, immunological, and behavioral factors. These include smoking, multiparity, early onset of sexual activity, multiple sexual partners, and low socioeconomic status, all of which have been associated with increased risk of viral persistence and malignant transformation (Perkins et al., 2023; Arip et al., 2022).

One of the major challenges in cervical cancer control lies in its typically asymptomatic early clinical course, which delays diagnosis until advanced stages in the absence of systematic screening programs. Numerous studies have demonstrated that the implementation of screening strategies, such as cervical cytology and HPV DNA testing, significantly reduces the incidence of invasive cancer and associated mortality. Nevertheless, the effectiveness of these strategies largely depends on population coverage and sustained adherence to screening programs, factors that are closely linked to the level of knowledge and understanding within the population regarding the disease and its diagnostic methods (Perkins et al., 2023; Terasawa et al., 2022).

In recent years, the World Health Organization has promoted a global strategy for the elimination of cervical cancer as a public health problem, establishing ambitious targets that include vaccinating 90 % of girls against HPV, screening 70 % of women at key ages, and providing timely treatment to 90 % of detected cases. Achieving these goals requires not only adequate healthcare infrastructure, but also an informed and empowered population that recognizes the importance of prevention and early diagnosis. Recent literature has consistently documented that knowledge levels regarding HPV, its relationship with cervical cancer, and screening tests vary significantly according to age, educational level, and sociocultural context, thereby influencing participation in screening

programs (Stephens et al., 2023; Khumalo et al., 2022).

Population-based studies conducted in different regions have shown that, even in contexts where screening programs are established, substantial deficiencies persist in the recognition of current diagnostic tests, particularly those integrating HPV detection as a primary or combined method. This lack of understanding not only limits the utilization of available tests, but also contributes to misperceptions of individual risk and the perceived need for preventive evaluations, especially among older women and groups with lower educational attainment (Tesfaw et al., 2021; Adewumi et al., 2022).

HPV vaccination represents a key intervention for the primary prevention of cervical cancer, with robust evidence demonstrating significant reductions in the incidence of precancerous lesions in vaccinated populations. Nevertheless, vaccine acceptance and coverage remain heterogeneous, influenced by information levels, cultural beliefs, and physician–patient communication. Recent research has highlighted that low awareness of the relationship between HPV and cervical cancer is associated with lower vaccination rates and, consequently, reduced long-term effectiveness of preventive programs (Stephens et al., 2023; CDC, 2025).

In this context, it is essential to analyze community understanding of cervical cancer diagnosis, using an approach that enables the identification of knowledge gaps, generational differences, and priority areas for educational intervention. Assessing community knowledge not only provides valuable information for public health planning, but also constitutes a critical input for strengthening communication between healthcare services and the population, improving adherence to screening, and advancing toward the goal of eliminating cervical cancer as a preventable disease. Accordingly, the present study aims to systematically analyze the level of understanding regarding cervical cancer diagnosis within a community cohort, contributing local evidence to contextualize current challenges and opportunities in the prevention of this malignancy.

METHODS, TECHNIQUES AND INSTRUMENTS

A prospective cohort study with an observational, descriptive–analytical approach was conducted to evaluate the level of understanding among women in the community regarding cervical cancer diagnosis, associated risk factors, and currently recommended early detection strategies. This methodological design was considered appropriate due to its capacity to systematically analyze the distribution of knowledge within a defined population and to explore potential differences associated with sociodemographic variables, particularly age, in line with evidence indicating marked heterogeneity in access to information and participation in screening programs across age groups and sociocultural contexts (Perkins et al., 2023; World Health Organization, 2025).

The study population consisted of women aged 18 years and older, residing in the municipalities of Tampico and Ciudad Madero, in the state of Tamaulipas, Mexico, with no professional or academic training in health-related fields. This delimitation was established to obtain a more accurate approximation of general community knowledge, excluding individuals whose information level might be influenced by professional training. The sample size was set at 100 participants, selected through simple random sampling, which helped reduce selection bias and improve representativeness within the local context.

Inclusion criteria comprised female sex, legal adulthood, permanent residence in the specified municipalities, and absence of a history of diagnosed active or previous gynecological disease. Exclusion criteria included women under 18 years of age, those with health-related training, prior diagnosis of relevant gynecological pathology, or cognitive limitations preventing adequate comprehension of the instrument. All participants provided informed consent prior to data collection, ensuring adherence to ethical principles of autonomy, confidentiality, and voluntariness, in accordance with international recommendations for observational public health research (World Health Organization, 2025).

Data collection was carried out using a structured questionnaire administered online via the Google Forms platform, selected for its accessibility and ability to ensure respondent anonymity. The instrument was designed to comprehensively assess general knowledge of cervical cancer, its relationship with HPV infection, risk factors recognized in the literature, and early diagnostic strategies, including cervical cytology, HPV detection, and combined testing. Additionally, sociodemographic information and relevant personal medical history were collected to contextualize findings and explore potential associations. The questionnaire structure was based on approaches previously used and validated in community studies on knowledge and practices related to cervical cancer screening, adapted to the local context (Khumalo et al., 2022; Stephens et al., 2023).

For data analysis, participants were grouped into predefined age ranges, allowing comparison between young adult women and older adult women, given that recent literature has identified age as a key determinant of risk perception, HPV-related knowledge, and utilization of early detection services (Tesfaw et al., 2021; Perkins et al., 2023).

Results were analyzed using descriptive statistics, including frequencies, percentages, and measures of central tendency, to characterize overall knowledge levels and variations among the evaluated groups. This approach enabled the identification of specific informational deficits relevant to planning community-focused educational interventions.

The adopted methodology aligns with current recommendations for research in secondary prevention of cervical cancer, which emphasize the importance of generating local evidence on cognitive

and knowledge-related barriers to optimize screening implementation and advance toward global elimination goals (World Health Organization, 2025; Ong et al., 2023). Thus, the methodological approach not only described the current state of community knowledge, but also provided relevant inputs for the design of evidence-based health education policies.

RESULTS AND DISCUSSION

Analysis of general knowledge assessments revealed a moderate overall level of understanding of cervical cancer, with a mean score of 5.0 on a scale from 0 to 10. This finding indicates that approximately half of the sample possessed basic knowledge, while the remainder demonstrated limited or no understanding of the topic. This pattern is consistent with international reports documenting persistent deficits in community knowledge regarding cervical cancer diagnosis, even in settings where screening programs are available (Khumalo et al., 2022; Stephens et al., 2023).

Heterogeneous performance across questionnaire items allowed identification of specific areas of strength and weakness. Items with the highest proportion of correct responses were related to general recognition of HPV, its mode of transmission, and the existence of preventive measures, including basic aspects of vaccination. In contrast, the greatest knowledge gaps were observed in questions related to timely diagnosis and current screening strategies, particularly those addressing specific diagnostic tests and their clinical indications.

These findings reflect a previously described trend whereby general awareness of HPV exceeds understanding of available diagnostic tools, thereby limiting informed participation in screening programs (Perkins et al., 2023).

Sociodemographic characterization of the cohort showed a balanced age distribution, as illustrated in Figure 1, minimizing bias associated with overrepresentation of a single age group. For comparative analysis, the sample was consolidated into two main groups: young adult women (18–30 years) and women older than 30 years.

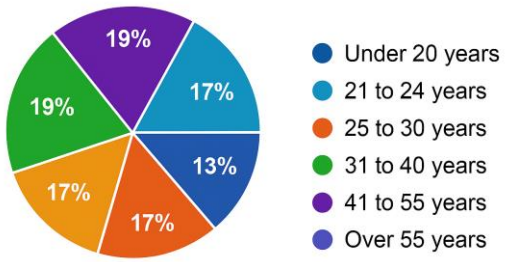

Figure 1. *Distribution of the sample by age groups*

This stratification revealed relevant differences in understanding of HPV and preventive measures, with approximately three quarters of participants demonstrating higher knowledge belonging to the young adult group. Conversely, lack of knowledge was more pronounced among women over 55 years of age, a finding consistent with studies documenting generational gaps in access to information and exposure to prevention campaigns (Tesfaw et al., 2021; Khumalo et al., 2022).

One of the most relevant findings concerned recognition of diagnostic tests. As shown in Figure 2, although a high proportion of participants identified the Papanicolaou test as a screening method, virtually all participants were unaware of combined cytology and HPV testing.

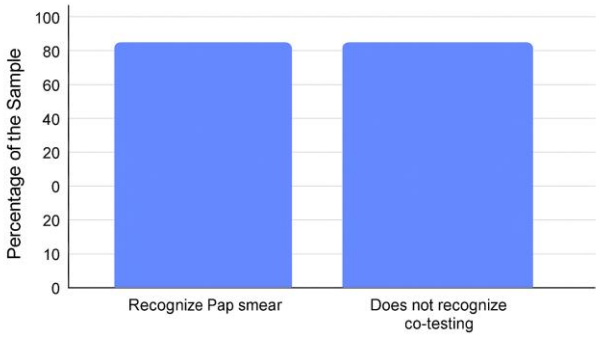

Figure 2. *Recognition of diagnostic tests for cervical cancer*

This result is particularly relevant from a public health perspective, as contemporary evidence supports primary HPV testing, alone or in combination with cytology, as the most sensitive strategy for early detection of high-grade cervical lesions (Terasawa et al., 2022; Perkins et al., 2023). The lack of association between this knowledge gap and age groups suggests that this informational deficit is widespread across the studied community.

Regarding risk factors and treatment of cervical cancer, a substantial knowledge deficit was observed. More than 70 % of participants failed to adequately identify disease-related risk factors, and over half were unaware of available therapeutic options. These findings are consistent with previous research indicating that etiological and therapeutic aspects are often less well understood by the general population, thereby hindering individual risk perception and sustained adoption of preventive behaviors (Adewumi et al., 2022; Ong et al., 2023).

Analysis of personal data provided additional context. Sixty percent of participants reported having one or more children, predominantly among adult women, especially those aged 31–40 years. Additionally, a considerable proportion reported behavioral risk factors such as multiple sexual partners and a history of tobacco use.

Smoking was more frequently reported among young adult women, a pattern described in other studies as an emerging factor that may increase the risk of persistent HPV infection in younger cohorts (Perkins et al., 2023).

Regarding preventive practices, routine gynecological check-ups and Pap testing were more common among adult women, suggesting greater adherence to preventive care with increasing age. However, the fact that 71 % of participants reported not having received information about HPV from their family physician or gynecologist highlights a significant failure in physician–patient communication, identified in the literature as a major barrier to screening and vaccination (Khumalo et al., 2022; World Health Organization, 2025).

Finally, HPV vaccination coverage was low among most participants, with a higher proportion of

vaccinated women or recalled vaccination history observed among young adults. This finding aligns with international data showing a generational impact of vaccination policies, while also underscoring the need to strengthen information and follow-up strategies among women outside traditionally prioritized age groups (CDC, 2025; Ong et al., 2023).

CONCLUSIONS

This study highlights that community understanding of timely cervical cancer diagnosis constitutes a critical component of effective secondary prevention strategies, beyond the mere availability of diagnostic tests and institutional programs. The generated evidence confirms that access to healthcare services alone does not guarantee adequate acquisition of the knowledge required for informed decision-making, posing a structural challenge for public health systems.

From a population perspective, the findings suggest that knowledge of cervical cancer and its diagnosis is not homogeneously distributed, but rather reflects complex generational, educational, and communicational dynamics. This heterogeneity implies that prevention strategies must move beyond generalized approaches and advance toward differentiated health education models capable of addressing the specific needs of each age and sociocultural group.

Furthermore, the study reveals that preventive practices, such as attendance at gynecological check-ups, are not always accompanied by a comprehensive understanding of the diagnostic process, thereby limiting their potential impact. This dissociation between practice and knowledge reinforces the need to strengthen clinical communication as a central axis of prevention, positioning healthcare professionals not only as service providers, but also as active agents of education and informational support.

In terms of public health implications, the results underscore the importance of integrating community knowledge assessment as a key indicator within cervical cancer prevention programs. Early identification of informational gaps enables more efficient targeting of educational interventions and systematic evaluation of their impact, contributing to the achievement of global goals for reducing incidence and mortality from this malignancy.

Finally, this work provides local evidence reinforcing the need to address cervical cancer through an integrated perspective, in which biomedical prevention is articulated with sustained strategies of education, communication, and community participation. Strengthening these components is essential to advance toward effective early detection and the progressive elimination of cervical cancer as a priority public health problem.

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