

The relationship between attitudes and beliefs toward HPV testing and fatalism among university students

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ABSTRACT

Aims: This study examined the relationship between fatalistic beliefs and attitudes toward human papillomavirus (HPV) testing among university students using a cross-sectional design.

Methods: A total of 332 students completed an online questionnaire that included the Attitudes and Beliefs Toward HPV Testing Scale and the Fatalism Tendency Scale.

Results: Although awareness of HPV (82.2%), HPV testing (78.0%), and the HPV vaccine (77.7%) was high, vaccination uptake was low (9.6%). Significant correlations were observed between fatalism and HPV testing attitudes, including positive correlations with Personal Barriers ($r=.28$), Social Norms ($r=.29$), and Anxiety ($r=.14$), and a negative correlation with Trust ($r=-.195$) ($p<.05$). SEM results confirmed these relationships, showing that fatalism increased Personal Barriers ($\beta=.352$), Social Norms ($\beta=.359$), and Anxiety ($\beta=.196$), while reducing Trust in HPV testing ($\beta=-.241$) (all $p<.001$). Model fit indices indicated acceptable fit ($\chi^2/df=2.59$; RMSEA=.075; CFI=.930; NNFI=.920).

Conclusion: These findings highlight fatalism as a significant determinant of HPV testing attitudes among university students, emphasizing the need for fatalism-targeted psychoeducational programs, self-efficacy enhancement, and stigma reduction strategies to reduce fatalistic perceptions and promote HPV-related preventive behaviors.

Keywords: HPV testing, fatalism, health beliefs, nursing students, preventive health behavior

INTRODUCTION

Human papillomavirus (HPV) is a highly prevalent sexually transmitted infection and a leading cause of several cancers later in life (CDC, 2024). HPV infection is associated with malignancies of the cervix, vulva, vagina, anus, rectum, penis and oropharynx, with cervical cancer accounting for more than 90% of HPV-related cancers in women (Ferlay et al., 2020). Effective prevention strategies include HPV vaccination and cervical cancer screening methods such as Pap smear and HPV DNA testing, and awareness of these methods significantly influences participation in screening programs (Mahmoud et al., 2024).

Beyond biomedical factors, HPV prevention and management are strongly shaped by sociocultural determinants. Cultural values, sexual norms, religious beliefs, and social taboos surrounding sexuality can limit access to reliable information and reduce engagement with preventive services, thereby hindering recognition of HPV as a sexually transmitted infection and lowering willingness to participate in vaccination and screening programs (Veeravagu et al., 2025). In addition, participation in cancer screening is influenced by limited knowledge, absence of symptoms leading to

low perceived need, embarrassment, and fear of diagnostic outcomes (Rosario-Ramos et al., 2022).

Fatalism is an important psychological construct influencing preventive health behaviors and refers to the belief that life events and health outcomes are predetermined and beyond individual control (Garrido, 2020). Individuals with stronger fatalistic beliefs tend to perceive cancer as uncontrollable and early detection as ineffective, which increases fear and discourages participation in screening behaviors (Vrinten, Wardle, & Marlow, 2016). Cancer fatalism, defined as the belief that death is inevitable once cancer occurs, has been identified as a significant barrier to cancer screening and the use of diagnostic and treatment services (Powe & Finnie, 2003). It has also been associated with reduced engagement in preventive health behaviors through its effects on knowledge, self-efficacy, and perceived control (Nagler & Hornik, 2012). Overall, fatalistic beliefs may lead to avoidance of preventive practices such as HPV testing and Pap smear screening (Marván & Catillo-López, 2016).

University students aged 18-25 represent a particularly vulnerable group for HPV infection. Risk is increased by

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inconsistent condom use, multiple sexual partners, low HPV vaccination uptake, and limited knowledge (Nkwonta et al., 2020). Living away from family, reduced supervision, and limited access to health services may further increase risky sexual behaviors (Dai et al., 2022). Sociocultural factors such as conservative family structures, education level, and socioeconomic status also shape attitudes toward sexuality, while cultural taboos surrounding sexual health communication may limit awareness and increase perceived risk (Dönmez et al., 2024).

Structural barriers further complicate HPV prevention efforts. In Türkiye, the HPV vaccine is not included in the national immunization program and is generally obtained privately, which limits accessibility and uptake (Akalın, 2022).

In line with WHO's global cancer prevention goals (WHO, 2023), examining sociocultural determinants-particularly fatalistic beliefs-is essential for improving participation in cervical cancer screening programs (Philipson et al., 2023). Addressing fatalism through psychoeducational interventions, enhancing self-efficacy, and reducing stigma may improve engagement in preventive behaviors among young women.

This study is grounded in the Powe Fatalism Model, which defines fatalism as a belief system characterized by inevitability, pessimism, luck, and divine control in relation to disease outcomes (Powe, 1995a). According to this model, individuals who perceive illness as predetermined are less likely to engage in preventive health behaviors, as fatalism reduces perceived control and undermines belief in the effectiveness of early detection. Although originally developed for colorectal cancer screening in older adults (Powe, 1995b), the model has also been applied to HPV-related preventive behaviors among young women (Taskin et al., 2024).

To date, no studies have directly examined the relationship between fatalism and HPV testing attitudes among university students. Considering that high-risk HPV types such as HPV 16 and 18 are responsible for approximately 70% of cervical cancers (Pimple, 2022), and that cervical cancer remains one of the leading causes of cancer-related mortality among women (Ferlay et al., 2020), this gap is important. Therefore, this study aims to examine how fatalistic beliefs shape university students' attitudes and beliefs toward HPV testing.

The present study aimed to address the following research questions:

1. Is there a significant relationship between the fatalism levels of university students and their attitudes and beliefs towards HPV testing?
2. Does the level of fatalism among university students significantly affect their attitudes and beliefs towards HPV testing?
3. Does an increase in fatalism lead to a significant change in attitudes and beliefs towards HPV testing?

METHODS

Ethics

This study was conducted with the approval of the Başkent University Clinical Ethics Committee for Non-interventional

Clinical Researches (Date: 17.04.2025, Decision No: E-91694447-604.01-452759). All procedures were carried out in accordance with the ethical rules and the principles of the Declaration of Helsinki. Written informed consent was obtained from all individual participants prior to their inclusion in the study.

Settings and Sample

This study was conducted at the Vocational School of Health Services at Başkent University, which offers two-year health-related programs and enrolls a socio-demographically diverse student population, between March 1 and December 1, 2025. Sample size estimation was performed using G*Power 3.1.9.2 based on multiple regression with 22 predictors. An effect size of $f^2=0.09$ (small-to-medium), significance level $\alpha=0.05$, and power $(1-\beta)=.90$ yielded a minimum required sample of 318 participants. A convenient sampling approach was employed because students were accessible via institutional platforms, allowing timely and practical recruitment. Inclusion criteria consisted of (1) being actively enrolled at the institution, (2) voluntary willingness to participate, and (3) ability to read and write in Turkish. Students who submitted incomplete, inconsistent, or erroneous survey responses were excluded from the analysis to ensure data quality and reliability.

Data Collection Procedure

Data collection was conducted online using a self-administered survey distributed via student communication portals and class announcement systems. Participants anonymously accessed the survey link and completed the questionnaire at their convenience. The web-based format was selected to enhance accessibility, minimize social desirability bias in response to sensitive questions regarding sexual behavior and beliefs, and ensure participant comfort and confidentiality. Prior to participation, students were provided with an electronic informed consent form outlining the study objectives, confidentiality measures, expected duration, and the voluntary nature of participation. The survey required approximately 10-12 minutes to complete. No personal identifiers, including name, student ID, IP address, or email address, were collected. All data were automatically recorded in a secure electronic database accessible only to the research team.

Instruments

Socio-demographic form: The socio-demographic form, developed by the researchers and informed by the literature, consisted of 21 items designed to assess demographic, sexual, and health-related characteristics, including age, marital status, income, living arrangements, sexual behavior, and substance use.

Attitudes and Beliefs Toward HPV Testing Scale: Developed by Tatar et al. (2023) and adapted into Turkish by Söğüt et al. (2024), this 20-item scale assesses psychological and social responses to HPV testing across four subscales: personal barriers, social norms, trust, and anxiety. Higher scores indicate more negative attitudes for all subscales except Trust. The Turkish version demonstrated strong internal consistency ($\alpha=0.769-0.892$ in this study; $0.856-0.981$ in the original adaptation), indicating acceptable to excellent reliability.

Fatalism Tendency Scale: Developed by Kaya and Bozkur (2015), this 24-item, 5-point Likert scale assesses fatalistic tendency across four subdimensions: predetermination, personal control, superstition, and chance. Total scores range from 24 to 120, with higher scores indicating greater fatalism. In this study, the mean score was 76.39 ± 11.37 . The scale demonstrated acceptable internal consistency, with Cronbach's alpha coefficients ranging from 0.718 to 0.807 across subdimensions.

Statistical Analysis

Descriptive statistics, reliability analyses, and structural equation modeling (SEM) were conducted. Normality was assessed using skewness and kurtosis (± 2) and supported by Q-Q plots (Demir, 2022). Frequencies, percentages, and descriptive statistics (mean, standard deviation, median, minimum, maximum) were reported for all variables. Internal consistency of the scales was evaluated using Cronbach's alpha.

Confirmatory factor analysis (CFA) was conducted using the DWLS estimation method. Model fit was assessed using χ^2 (Chi-square), degrees of freedom (df), χ^2/df (CMIN/DF), GFI, AGFI, CFI, TLI, NNFI, RMSEA, and SRMR fit indices (Hu& Bentler, 1999; Kline, 2023). Path diagrams for the CFA models were generated in R using the lavaan package (Karch, 2025).

Structural equation modeling was performed using the lavaan package in R (Rosseel, 2012). Graphical representations of the models were produced with the semPlot package (Epskamp & Stuber, 2017), and relationships among variables were visualized using the ggcorrplot package (Kassambara, 2023). Analyses were conducted in R using the lavaan, semPlot, and ggcorrplot packages, with statistical significance set at $p < 0.05$.

RESULTS

A total of 332 university students participated in the study. Descriptive characteristics and sexual health-related variables are presented in Table 1A, 1B. The majority of participants were female (81.6%), lived in a nuclear family structure (80.7%), and reported prior awareness of HPV (82.2%) and HPV testing (78.0). Only 9.6% had received the HPV vaccine.

Table 2 presents the descriptive statistics for the Attitudes and Beliefs About HPV Testing Scale and the Fatalism Tendency Scale. Among the HPV attitude subdimensions, trust had the highest mean score (33.68 ± 6.93), followed by personal barriers (21.72 ± 7.48) and social norms (15.29 ± 5.93). Anxiety scores were comparatively lower (11.64 ± 4.15). Cronbach's alpha coefficients ranged from .718 to .892, indicating acceptable to high internal consistency. For the fatalism subdimensions, Predetermination (24.77 ± 4.79) and Superstitious Beliefs (16.16 ± 4.67) had the highest mean scores. The total fatalism score demonstrated adequate reliability ($\alpha = .791$).

Figure presents the correlations among fatalism subdimensions and attitudes toward HPV testing. Personal Control showed negative associations with several variables, including trust ($r = -.36$) and fatalism tendency ($r = -.40$). Social norms had small positive correlations with predetermination ($r = .21$), fatalism tendency ($r = .29$), superstitious beliefs ($r = .21$), luck ($r = .21$), and personal barriers ($r = .20$). Trust correlated negatively with fatalism tendency ($r = -.12$), superstitious beliefs ($r = -.08$), and luck ($r = -.20$). Fatalism subdimensions

Table 1A. Sociodemographic characteristics of the participants (n=332)

Variables	n (%)
Year of study	
1 st year	197 (59.3)
2 nd year	135 (40.7)
Gender	
Female	271 (81.6)
Male	61 (18.4)
Family type	
Nuclear family	268 (80.7)
Extended family	43 (13.0)
Single-parent / separated family	21 (6.3)
Mother's education level	
Illiterate	3 (0.9)
Literate	9 (2.7)
Primary school	65 (19.6)
Middle school	73 (22.0)
High school	135 (40.7)
College or higher	47 (14.2)
Father's education level	
Literate	3 (0.9)
Primary school	51 (15.4)
Middle school	68 (20.5)
High school	140 (42.2)
College or higher	70 (21.1)
Perceived income status	
Income lower than expenses	33 (9.9)
Income equal to expenses	199 (59.9)
Income higher than expenses	100 (30.1)
Current living arrangement	
Family home	273 (82.2)
Student house	15 (4.5)
Living alone	9 (2.7)
Dormitory	35 (10.5)
Smoking status	
Yes	137 (41.3)
Quit	15 (4.5)
No	180 (54.2)
Alcohol use	
Never	204 (61.4)
Once a month	67 (20.2)
Several times a month	24 (7.2)
Once a week	14 (4.2)
Several times a week	10 (3.0)
Quit	13 (3.9)

demonstrated moderate intercorrelations, particularly between predetermination and fatalism tendency ($r = .77$) and between fatalism tendency and superstitious beliefs ($r = .70$). Personal barriers and anxiety were moderately correlated ($r = .36$).

The structural equation model demonstrated an acceptable overall fit to the data, as indicated by $\chi^2/\text{df} = 2.59$, CFI = 0.93, NNFI = 0.92, and RMSEA = 0.075 (90% CI: 0.071-0.079).

Table 1B. Sociodemographic characteristics of the participants (n=332) (continued)

Variables	n (%)
Use of contraceptive methods during sexual intercourse	
Yes	62 (18.7)
No	270 (81.3)
Awareness of HPV	
Yes	273 (82.2)
No	36 (10.8)
Not sure	23 (6.9)
Awareness of HPV testing	
Yes	259 (78.0)
No	52 (15.7)
Not sure	21 (6.3)
Awareness of HPV vaccine	
Yes	258 (77.7)
No	54 (16.3)
Not sure	20 (6.0)
History of HPV vaccination	
Yes	32 (9.6)
No	300 (90.4)
History of HPV diagnosis	
Yes	3 (0.9)
No	329 (99.1)
History of HPV treatment	
Yes	3 (0.9)
No	329 (99.1)

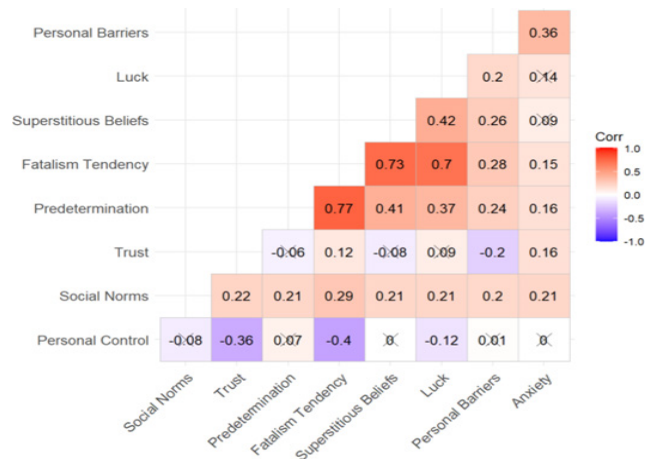
HPV: Human papillomavirus

Table 2. Descriptive statistics for the Attitudes and Beliefs About HPV Testing Scale and the Fatalism Tendency Scale

Variables	Mean±SD	Median (min-max)	Alpha
Personal barriers	21.72±7.48	21 (7-46)	0.769
Social norms	15.29±5.93	16 (4-28)	0.788
Trust	33.68±6.93	35 (6-42)	0.892
Anxiety	11.64±4.15	12 (3-21)	0.779
Predetermination	24.77±4.79	25 (10-38)	0.786
Personal control	12.23±3.80	12 (6-30)	0.807
Superstition	16.16±4.67	16 (6-30)	0.763
Chance	12.03±3.19	12 (4-20)	0.718
Fatalism tendency (total)	76.39±11.37	76 (25-115)	0.791

HPV: Human papillomavirus, SD: Standard deviation, Min: Minimum, Max: Maximum

Although GFI (0.893) and AGFI (0.889) were slightly below the recommended thresholds, they remained within an acceptable range, supporting the adequacy of the model. **Table 3** presents the structural model results examining the effect of fatalism tendency on attitudes and beliefs toward HPV testing. Fatalism was found to have a positive and statistically significant effect on personal barriers ($\beta=0.352$, $B=1.419$, $SE=0.205$, $z=6.935$, $p<0.001$), social norms ($\beta=0.359$, $B=1.856$, $SE=0.270$, $z=6.884$, $p<0.001$), and anxiety ($\beta=0.196$, $B=0.734$, $SE=0.129$, $z=5.676$, $p<0.001$), while it had a negative and significant effect on trust ($\beta=-0.241$, $B=-1.239$, $SE=0.180$, $z=-6.864$, $p<0.001$). These findings indicate that higher levels of fatalism are associated with increased perceived barriers,

**Figure.** Correlations between the Attitudes and Beliefs About HPV Testing Scale and the Fatalism Tendency Scale

HPV: Human papillomavirus

Table 3. Structural model results for the effect of fatalism on attitudes and beliefs toward HPV testing

Dimension	Std. (beta)	Beta	SE	z	p
Personal barriers (PB) $\leftarrow$ fatalism tendency	0.352	1.419	0.205	6.935	<0.001
Social norms (SN) $\leftarrow$ fatalism tendency	0.359	1.856	0.270	6.884	<0.001
Trust (TR) $\leftarrow$ fatalism tendency	-0.241	-1.239	0.180	-6.864	<0.001
Anxiety (AN) $\leftarrow$ fatalism tendency	0.196	0.734	0.129	5.676	<0.001

HPV: Human papillomavirus, Std: Standard, SE: Standard error

stronger social normative influences, greater anxiety, and reduced trust regarding HPV testing. The R^2 values of the structural model indicate that 12.4% of the variance in personal barriers, 12.9% in social norms, 5.8% in trust, and 3.8% in anxiety are explained by the model.

DISCUSSION

This study examined the relationship between fatalistic beliefs and university students' attitudes and beliefs toward HPV testing. Although HPV awareness was high-with 82.2% of students reporting familiarity with HPV and 77.7% awareness of the HPV vaccine-only 9.6% had been vaccinated. This marked discrepancy between knowledge and preventive behavior aligns with global evidence indicating persistently low vaccination uptake despite moderate to high awareness levels (Escoffery et al., 2023). This study contributes to the existing literature by examining the role of fatalistic beliefs in shaping attitudes toward HPV testing within a structural equation modeling framework in a Turkish university population, thereby providing context-specific insights into sociocultural determinants of preventive health behaviors.

Contextual factors, including the exclusion of HPV vaccination from national immunization programs, financial barriers, and limited knowledge regarding vaccine safety, may contribute to the development of fatalistic attitudes (Okay et al., 2022; Çınar & Çetin, 2024). In the present study, lower perceived personal control was significantly associated with higher levels of fatalism ($r=0.40$), supporting the notion that fatalism operates through diminished perceived agency and increased perceived barriers.

Although sexual stigma was not directly measured, the findings should be interpreted in light of existing evidence indicating that stigma-along with religious beliefs and social norms-can influence both HPV testing attitudes and fatalistic beliefs (Fujisawa & Hagiwara, 2015). Accordingly, cultural and religious values, as well as prevailing social norms, may play a critical role in shaping health-related perceptions and behaviors.

The findings further suggest that fatalistic beliefs are associated with individuals' cognitive and emotional evaluations of screening procedures. Consistent with this perspective, fatalism was positively associated with personal barriers ($r=0.28$) and anxiety ($r=0.15$). These results are in line with previous studies demonstrating that perceived barriers are strongly linked to cervical cancer screening behaviors (Gutusa & Roets, 2023; Nyaaba & Akurugu, 2023). Personal barriers, including stigma, misconceptions, fear, and discomfort related to examination procedures, appear to be more prevalent among individuals with higher fatalistic tendencies.

Anxiety also emerged as a significant factor influencing HPV testing attitudes. Previous research indicates that uncertainty regarding screening intervals and recommended ages may increase fear and reduce willingness to undergo testing (Tatar et al., 2023). The discomfort reported by participants in relation to changes in screening initiation age may reflect underlying emotional responses that shape attitudes toward HPV testing. These findings underscore the importance of clear, accessible, and student-centered communication strategies to reduce uncertainty and alleviate fear.

The theoretical framework also highlights a social dimension, suggesting that fatalism is associated with normative influences. In this study, significant positive relationships were observed between social norms and fatalism, indicating that individuals with stronger fatalistic beliefs may rely more heavily on family and peer guidance when making decisions about HPV testing. This pattern may be explained by developmental and contextual factors, such as economic dependence and limited sexual health literacy during university years.

Previous research grounded in the Powe Fatalism Model (PFM) has demonstrated that demographic factors-including age, gender, income, and education-are associated with cancer-related knowledge and fatalistic beliefs. Studies have consistently shown that higher levels of fatalism are linked to lower educational attainment, reduced knowledge, and decreased participation in screening programs (Powe, 1995a; Keller et al., 2021; Cohen et al., 2022). These findings highlight the combined influence of psychological and structural determinants on preventive health behaviors.

Within this framework, psychological mechanisms appear to shape attitudes and anxiety related to HPV testing, while social norms influence how these attitudes translate into behavior. Consistent with this model, the present study identified significant associations between fatalism and the personal barriers and social norms subdimensions. Similarly, prior research has indicated that fatalistic beliefs may influence HPV vaccination behaviors through social

normative processes (Taskin et al., 2024), suggesting a potential moderating role of social context.

The Fatalism Tendency Model further supports the role of fatalism in shaping cancer-related attitudes within broader sociocultural and psychological contexts. Evidence suggests that fatalism is associated with screening behaviors, Pap smear intentions, and general health beliefs (Selvi & Kaya, 2022; Güneş & Başkan, 2024). In the present study, significant associations were observed among predetermination, personal control, superstition, and chance dimensions ($p<0.001$), indicating that perceiving life events as predetermined is linked to stronger fatalistic tendencies. This finding is consistent with previous research highlighting the relationship between fatalism and perceived control (Guo et al., 2021).

Among the fatalism dimensions, superstition demonstrated the strongest association with overall fatalism, aligning with evidence that superstitious beliefs may delay healthcare-seeking behavior and increase reliance on non-evidence-based practices (Lord et al., 2012). In this study, the strongest correlations were observed for superstition ($r=0.73$) and chance ($r=0.70$). These findings are consistent with previous research indicating that lower levels of fatalism are associated with greater participation in screening programs (Chen & Kim, 2024; Özen, 2025).

Furthermore, prior studies have shown that fatalistic beliefs are associated with lower HPV vaccine uptake and reduced completion of vaccination schedules (Vanderpool et al., 2015; Taskin et al., 2024), supporting the broader influence of fatalism on preventive health behaviors.

Limitations

A key strength of this study lies in its examination of the mediating role of beliefs about HPV testing in the relationship between fatalistic tendencies and attitudes toward HPV testing among university students using a structural equation modeling framework. In addition, a theory-driven model was employed to explore the potential cognitive, emotional, and social pathways through which fatalistic beliefs are associated with HPV testing attitudes. Several limitations should be acknowledged. First, the cross-sectional design precludes the assessment of temporal relationships among variables, highlighting the need for longitudinal research. Second, data were collected exclusively through web-based questionnaires, which may have introduced response bias and limited participation among individuals with lower digital literacy or restricted internet access.

CONCLUSION

The structural equation model demonstrated satisfactory goodness-of-fit indices, supporting the adequacy of the measurement and structural models. Overall, the findings indicate that fatalism is significantly associated with all subdimensions of attitudes toward HPV testing, suggesting that it operates through interconnected cognitive, emotional, and social pathways.

Taken together, these findings highlight fatalism as an important factor shaping HPV testing attitudes among university students. Interventions targeting fatalistic beliefs-such as psychoeducational programs, strategies to enhance self-efficacy, and stigma reduction approaches-may contribute to

improved engagement in preventive behaviors. Strengthening perceived personal control, addressing misconceptions, and reducing superstition-based interpretations may increase participation in HPV testing and help reduce disparities in preventive health outcomes among young adults.

ETHICAL DECLARATIONS

Ethics Committee Approval

This study was conducted with the approval of the Başkent University Clinical Ethics Committee for Non-interventional Clinical Researches (Date: 17.04.2025, Decision No: E-91694447-604.01-452759).

Informed Consent

Written informed consent was obtained from all individual participants prior to their inclusion in the study. Participants were fully informed about the study's aims, procedures, potential risks and benefits, and their rights-including the right to withdraw at any time without consequence. All participants voluntarily signed a written informed consent form.

Peer Review Process

This manuscript was subject to external peer review.

Conflict of Interest

The authors declare no conflicts of interest related to this study.

Financial Disclosure

The authors received no financial support for the conduct or publication of this research.

Author Contributions

Designed the Study: HKY, CAT; Collected the Data: HKY, CAT; Analyzed the Data: CAT; Prepared the Manuscript: HKY, CAT; All Authors Approved the Final Version for Submission.

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REFERENCES

- Akalın, A. (2022). Human papillomavirus (HPV) enfeksiyonu ve HPV aşısında güncel yaklaşımlar. *Androloji Bülteni*, 24(2), 133-139. <https://doi.org/10.24898/tandro.2022.25993>
- Centers for Disease Control and Prevention. (2024, July 3). About HPV. <https://www.cdc.gov/hpv/about/>
- Chen, M., & Kim, H. K. (2024). Cancer fatalism in the information age: a meta-analysis of communicative and behavioral correlates. *Communication Research*, 51(1), 83-111. <https://doi.org/10.1177/00936502231205>
- Çınar, D., & Abalı Çetin, S. (2024). 18-65 yaş arasındaki kadınların serviks kanserinden korunmaya yönelik HPV enfeksiyonu ve aşılmasına ilişkin sağlık inanç düzeyleri. *Etkili Hemşirelik Dergisi*, 17(2), 256-269. <https://doi.org/10.46483/jnef.1468570>
- Cohen, M., Rosenfeld, M., & Greenblatt-Kimron, L. (2022). Associations between cancer fatalism, causal attributions, and perceptions of benefits and barriers to screening for colorectal cancer. *International Journal of Behavioral Medicine*, 29(3), 357-366. <https://doi.org/10.1007/s12529-021-10023-z>
- Dai, Z., Si, M., Su, X., Wang, W., Zhang, X., Gu, X., Ma, L., Li, J., Zhang, S., Ren, Z., & Qiao, Y. (2022). Willingness to human papillomavirus (HPV) vaccination and influencing factors among male and female university students in China. *Journal of Medical Virology*, 94(6), 2776-2786. <https://doi.org/10.1002/jmv.27478>
- Demir, S. (2022). Comparison of normality tests in terms of sample sizes under different skewness and kurtosis coefficients. *International Journal of Assessment Tools in Education*, 9(2), 397-409. <https://doi.org/10.21449/ijate.1101295>
- Dönmez, E., Temiz, G., Çalı, Z., Üngör, S., Kenan, B., & Ahmadi, N. (2024). Üniversite öğrencilerinin HPV bilgi düzeyi, algı ve tutumlarının değerlendirilmesi. *Gümüşhane Üniversitesi Sağlık Bilimleri Dergisi*, 13(4), 1751-1766. <https://doi.org/10.37989/gumussagbil.1368359>
- Epskamp, S., & Stuber, S. (2017). semPlot: path diagrams and visual analysis of various SEM packages' output (R package version 1).
- Escoffery, C., Petagna, C., Agnone, C., Perez, S., Saber, L. B., Ryan, G., et al. (2023). A systematic review of interventions to promote HPV vaccination globally. *BMC Public Health*, 23(1), 1262. <https://doi.org/10.1186/s12889-023-15876-5>
- Ferlay, J., Laversanne, M., Ervik, M., Lam, F., Colombet, M., Mery, L., Piñeros, M., Znaor, A., Soerjomataram, I., & Bray, F. (2020). Global cancer observatory: cancer tomorrow. International agency for research on cancer. <https://gco.iarc.fr/tomorrow>
- Fujisawa, D., & Hagiwara, N. (2015). Cancer stigma and its health consequences. *Current Breast Cancer Reports*, 7(3), 143-150. <https://doi.org/10.1007/s12609-015-0185-0>
- Garrido, C. O. (2020). Psychological underpinnings of cervical cancer screening intentions among the underserved: an examination of the influence of cancer fatalistic notions and associated cognitions. *Cancer Epidemiology, Biomarkers & Prevention*, 29(6 Suppl. 2), B049.
- Güneş, D., & Başkan, S. A. (2024). Does fatalism affect cancer screenings? *Journal of Oncology Sciences*, 10(1), 1-8. <https://doi.org/10.37047/jos.2022-90447>
- Guo, X. M., Tom, L., Leung, I., O'Brian, C., Zumpf, K., & Simon, M. (2021). Associations between fatalistic cancer beliefs and cancer-screening behaviors in Chinese American immigrant women. *Journal of Immigrant and Minority Health*, 23(4), 699-706. <https://doi.org/10.1007/s10903-021-01144-4>
- Gutusa, F., & Roets, L. (2023). Early cervical cancer screening: the influence of culture and religion. *African Journal of Primary Health Care & Family Medicine*, 15(1), e1-e6. <https://doi.org/10.4102/phcfm.v15i1.3776>
- Hu, L. T., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: conventional criteria versus new alternatives. *Structural Equation Modeling: a Multidisciplinary Journal*, 6(1), 1-55. <https://doi.org/10.1080/10705519909540118>
- Karch, J. D. (2025). Lavaangui: a web-based graphical interface for specifying lavaan models by drawing path diagrams. *Structural Equation Modeling: a Multidisciplinary Journal*, 32(6), 1077-1088. <https://doi.org/10.1080/10705511.2024.2420678>
- Kassambara, A. (2023). Ggcorrplot: visualization of a correlation matrix using "ggplot2" (R package version 0.1.4.999) [Computer software]. GitHub. <https://github.com/kassambara/ggcorrplot>
- Kaya, A., & Bozkur, B. (2015). Kadercilik eğilimi ölçeğinin geliştirilmesi: geçerlik ve güvenirlik çalışması. *Mersin Üniversitesi Eğitim Fakültesi Dergisi*, 11(3), 935-946. <https://doi.org/10.17860/efd.55137>
- Keller, K. G., Toriola, A. T., & Schneider, J. K. (2021). The relationship between cancer fatalism and education. *Cancer Causes & Control: CCC*, 32(2), 109-118. <https://doi.org/10.1007/s10552-020-01363-4>
- Kline, R. B. (2023). Principles and practice of structural equation modeling (5th ed.). Guilford Press.
- Lord, K., Mitchell, A. J., Ibrahim, K., Kumar, S., Rudd, N., & Symonds, P. (2012). The beliefs and knowledge of patients newly diagnosed with cancer in a UK ethnically diverse population. *Clinical oncology (Royal College of Radiologists (Great Britain))*, 24(1), 4-12. <https://doi.org/10.1016/j.clon.2011.05.008>
- Mahmoud, I., Al Eid, M. M. A., Mohamed, M. A., Aladwani, A. J., & El Amin, N. E. M. (2024). Human papillomavirus vaccination and pap test uptake, awareness, and barriers among young adults in Gulf Cooperation Council countries. *Journal of Infection and Public Health*, 17(10), 102525. <https://doi.org/10.1016/j.jiph.2024.102525>
- Marván, M. L., Ehrenzweig, Y., & Castillo-López, R. L. (2016). Fatalistic beliefs and cervical cancer screening among Mexican women. *Health Care for Women International*, 37(1), 140-154. <https://doi.org/10.1080/07399332.2014.959169>

- Nagler, R. H., & Hornik, R. C. (2012). Measuring media exposure to contradictory health information: a comparative analysis of four potential measures. *Communication Methods and Measures*, 6(1), 56-75. <https://doi.org/10.1080/19312458.2011.651348>
- Nkwonta, C. A., Dawson, R. M., & Adegboyega, A. (2022). "I don't think I have a chance to get it": international university student HPV knowledge and preventive behaviors. *Journal of American College Health*, 70(1), 240-247. <https://doi.org/10.1080/07448481.2020.1740232>
- Nyaaba, J. A., & Akurugu, E. (2023). Knowledge, barriers and uptake towards cervical cancer screening among female health workers in Ghana: a perspective of the Health Belief Model. *International Journal of Africa Nursing Sciences*, 19, 100587. <https://doi.org/10.1016/j.ijans.2023.100587>
- Okay, A., Soydam Aydın, S., & Akın, L. (2022). İnsan papilloma virüsü (HPV) ve aşılarının kullanımı sonrası toplumsal etkileri. *Abant Medical Journal*, 11(1), 143-151. <https://doi.org/10.47493/abantmedj.977792>
- Özen, E. (2025). Kadınların jinekolojik kanser farkındalık düzeylerinin ve meme kanseri kadercilik algılarının belirlenmesi [Yüksek lisans tezi, Harran Üniversitesi]. YÖK Ulusal Tez Merkezi.
- Philipson, T. J., Durie, T., Cong, Z., & Fendrick, A. M. (2023). The aggregate value of cancer screenings in the United States: full potential value and value considering adherence. *BMC Health Services Research*, 23(1), 829. <https://doi.org/10.1186/s12913-023-09738-4>
- Pimple, S., & Mishra, G. (2022). Cancer cervix: epidemiology and disease burden. *CytoJournal*, 19, 21. https://doi.org/10.25259/CMAAS_03_02_2021
- Powe B. D. (1995). Cancer fatalism among elderly Caucasians and African Americans. *Oncology Nursing Forum*, 22(9), 1355-1359.
- Powe, B. D. (1995b). Fatalism among elderly African Americans: effects on colorectal cancer screening. *Cancer Nursing*, 18(5), 385-392.
- Powe, B. D., & Finnie, R. (2003). Cancer fatalism: the state of the science. *Cancer Nursing*, 26(6), 454-467. <https://doi.org/10.1097/00002820-200312000-00005>
- Rosario-Ramos, L. P., Acosta-Martínez, X., Torres-Marrero, S. D., & Torres-Lorenzo, A. (2022). Shame and embarrassment in human papilloma virus (HPV) screening for cervical cancer: a narrative literature review. *Salud y Conducta Humana*, 9(1), 24-43.
- Rosseel, Y. (2012). lavaan: an R package for structural equation modeling. *Journal of Statistical Software*, 48(2), 1-36. <https://doi.org/10.18637/jss.v048.i02>
- Selvi, A., & Kaya, H. (2022). The relationship between learning needs and fatalism tendency in women who have a relative with breast cancer. *Journal Of Religion and Health*, 61(2), 1333-1350. <https://doi.org/10.1007/s10943-021-01339-x>
- Söğüt, S. C., Küçükkaya, B., & Cangöl, E. (2024). HPV testi hakkındaki tutum ve inançlar ölçeği Türkçe geçerlik ve güvenilirlik çalışması. *Türkiye Klinikleri Journal of Nursing Sciences*, 16(3), 691-701. <https://doi.org/10.5336/nurses.2023-100831>
- Taskin, T., Roncancio, A. M., Cano, M. Á., Valente, M., Rahman, A., & Thompson, E. L. (2024). Cancer fatalism is associated with HPV vaccine uptake among Hispanic emerging adult women in the US. *Vaccine*, 42(26), 126417. <https://doi.org/10.1016/j.vaccine.2024.126417>
- Tatar, O., Haward, B., Zhu, P., Griffin-Mathieu, G., Perez, S., McBride, E., Lofters, A. K., Smith, L. W., Mayrand, M.-H., Daley, E. M., Brotherton, J. M. L., Zimet, G. D., & Rosberger, Z. (2023). Understanding the challenges of HPV-based cervical screening: development and validation of HPV testing and self-sampling attitudes and beliefs scales. *Current Oncology*, 30(1), 1206-1219. <https://doi.org/10.3390/curroncol30010093>
- Vanderpool, R. C., Dressler, E. V., Stradtman, L. R., & Crosby, R. A. (2015). Fatalistic beliefs and completion of the HPV vaccination series among a sample of young Appalachian Kentucky women. *The Journal of Rural Health : Official Journal of the American Rural Health Association and the National Rural Health Care Association*, 31(2), 199-205. <https://doi.org/10.1111/jrh.12102>
- Veeravagu, T., Hamdiui, N., Stein, M. L., Crutzen, R., & Timen, A. (2025). Barriers, facilitators, needs, and preferences in seeking information regarding cervical cancer prevention programs among Turkish, Moroccan, and Syrian immigrant women: a scoping review. *BMC Public Health*, 25(1), 1242. <https://doi.org/10.1186/s12889-025-22359-2>
- Vrinten, C., Wardle, J., & Marlow, L. A. (2016). Cancer fear and fatalism among ethnic minority women in the United Kingdom. *British Journal of Cancer*, 114(5), 597-604. <https://doi.org/10.1038/bjc.2016.15>
- World Health Organization. (2023). Preventing cancer. <https://www.who.int/activities/preventing-cancer>