



UNIVERSITY OF PADOVA

Department of General Psychology*

Bachelor's Degree Course in Psychological Science

Final dissertation

**The psychosexual impact of an HPV diagnosis and how it
affects sexual function: A Systematic Review**

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Abstract

Human papillomavirus (HPV) is one of the most prevalent sexually transmitted viruses in the recent period. The complications of the virus effect most commonly genital parts of humans, especially in women causing cervical, vulvar or vaginal lesions. The impact it has on the genitalia and the pathway of transmission is dominantly sexual. Thus, the virus brings a psychosexual burden on the individual in addition to the physical and psychological one. This systematic review aims to combine and analyze the currently available literature and to detect the psychosexual impact of HPV on levels of sexual function and sexual behavior. Literature search was conducted, articles were selected using the Preferred Reporting Items for Systematic Review and Meta-Analysis (PRISMA) model and screened according to exclusion and inclusion criteria. They were rated using standardized quality appraisal tools of Joanna Briggs Institute (JBI) Critical Appraisal Checklist for Quantitative Studies, Critical Appraisal Skills Programme (CASP) Checklist for Qualitative Studies, and Mixed Methods Appraisal Tool (MMAT) 2018 Edition. Using a narrative synthesis, this review covers areas of changes in sexual functioning with HPV, the emotional burden of human papillomavirus, and its sexual link, also touching relationship dynamics and specific emotional reactions. This review attempts to combine and analyze data from various methodological approaches and diverse populations.

Keywords: *human papillomavirus, HPV, psychosexual impact, sexual function, sexual behavior*

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Introduction

Human papillomavirus (HPV) has become one of the most prevalent and common sexually transmitted infections (STIs), with over 90% of sexually active males and 80% of sexually active women contracting HPV at some point in their lives (National Cancer Institute, n.d.). The infection may cause growth of warts or lesions in various parts of the body, including but not limited to the hands, face, and genitals. There are over 100 types of the virus, nearly 30 affecting the genital regions. These variants of genitally affecting virus can be high-risk leading to cervical, anal, vulvar or vaginal cancers or they can be low risk leading to genital warts (Braaten & Laufer, 2008). Infection with the number 16 and 18 variants of the virus was demonstrated to be present in 70% of cervical cancers (Clifford et al., 2003). Although being infected with HPV can cause genital cancers in some cases, many others are cleared by the virus within a 2-year time frame. (Verhoeven et al., 2010) The operation to biopsy the precancerous lesions caused by HPV is called colposcopy. If the precancerous lesions were determined to be potentially harmful in the sense of developing into cancer, the patient is referred to undergo the Loop electrosurgical excision procedure (LEEP), where the hostile tissue is removed. According to figures, HPV was responsible for 620,000 new cancer cases in women and 70,000 new cancer cases in men worldwide in 2018 (de Martel et al., 2020). In a more recent study by the Centers for Disease Control and Prevention, in the United States, HPV is thought to be responsible for approximately 37,800 new cases of cancer yearly (Centers for Disease Control and Prevention [CDC], 2023). HPV can be transmitted through skin-to-skin contact as well as sexual intercourse. Due to the absence of visible symptoms apart from the wart-creating kinds, most individuals are unaware of the infection. There is currently no treatment for the infection of HPV; however, prevention techniques and treatments for warts and cervical cancer are available. The most effective prevention technique is vaccination and regular screening procedures. It is suggested to apply the vaccine Gardasil to both genders between the ages of

9-12, for more effective protection, and up to age 26. (Meites et al., 2019). The preventive measures are getting extensively promoted by governments each year, especially after the World Health Organization (WHO) established a global strategy targeting the prevention of HPV and related cervical cancer. Since then, at least 144 nations have implemented the HPV vaccine, more than 60 countries have included HPV testing in their cervical screening programs, and 83 countries have included surgical care for cervical cancer in their health-benefit packages (World Health Organization, 2024).

Considering the nature of human papillomavirus, the infection is usually transmitted through sexual interactions. Thus, it is only natural for this virus to have psychosexual consequences for the patients. Psychosexual consequences are the effects of psychological factors on sexual functioning, relationships, and well-being (O'Connor et al., 2014). Due to HPV being positive in a large part of the population, attention should be dedicated to its psychosexual implications.

Sexuality is an important aspect of health and well-being, which was defined by the World Health Organization in four spheres: physical, emotional, social, and mental (World Health Organization, 2006). Within sexuality, sexual functioning can be defined as the response affected by the intricate interplay between mind and body. These responses include desire, arousal, satisfaction, or orgasm for both genders, while also some gender specific functions exist. For females, this can be illustrated as lubrication, while for men it includes erection or ejaculation (Rosen et al., 2011; Kalmbach et al., 2015). Since sexual functioning cannot be reduced solely to bodily functions, it is affected by mental and social factors. Sexual function affects sexual well-being, which is bidirectionally tied to the general well-being of a person (World Health Organization, n.d.). It was revealed by the studies on HIV or herpes that being diagnosed with an STI had negative effects on the person's psychosexual state and sexual functioning (Sherr, 1995). These effects included anxiety, depression, reduced sexual desire or

satisfaction, sexual dysfunctions, problems in sexual relationships within couples, changes in sexual self-image, changes in sexual behavior, and sexual functioning. (Singh & Singh, 2021).

There were past reviews about the psychosexual sphere of being infected with human papillomavirus (Bennett et al., 2019) and the burden of undergoing HPV and related procedures (Sikorska et al., 2023). However, due to the relevance of human papillomavirus and the existence of new data, this area of HPV stands out as a topic that should be covered. This systematic review aims to synthesize current literature on the psychosexual impact of HPV and its influence on sexual behavior.

Methods

Search Process

The search was conducted on the databases of PubMed (MEDLINE), Scopus, EBSCO (APA PsycINFO), and Web of Science. The search included keywords of a) HPV OR human papillomavirus AND b) psychosexual impact OR sexual function OR sexual dysfunction OR sexual behavior OR sexual identity. The studies that were conducted between 2010-2024 were searched. The methodology was not specified during the research; all qualitative, quantitative, mixed, or longitudinal study methods were included. The population included HPV positive individuals. By using the reference list of already found articles, a backward citation search was used. In addition, to include newer research forward citation search was conducted.

Inclusion and Exclusion Criteria

Editorials, opinion articles, reviews, conference abstracts, and commentaries were excluded. The included articles were searched to be in English. The studies that had irrelevant outcomes or that were not peer-reviewed were excluded from the study.

Study Selection Process

The articles were screened by moving from the title to the abstract and then the full text when needed. They were screened by two reviewers (G.G.G. & S.C.). The selection process was conducted via the guidelines of Preferred Reporting Items for Systematic Review and Meta-Analysis (PRISMA). The PRISMA flowchart is illustrated in Figure 1.

Data Extraction

Two reviewers took information out of each article using a standardized data extraction form based on PRISMA guidelines. Authors and year of publication, country, sample size, demographics of the participants, outcomes measured in the study, study procedures and tools, comparison groups (if any), and an overview of psychosexual and sexual outcomes and impacts were extracted (Table 2).

Quality Appraisal

The methodological quality of the selected studies was assessed by using the checklists of the Joanna Briggs Institute (JBI) Critical Appraisal Checklist for quantitative studies and Critical Appraisal Skills Programme (CASP) Checklist for qualitative studies. Mixed-method studies were analyzed using the Mixed Methods Appraisal Tool (MMAT) 2018 edition. Based on the number of criteria satisfied and the overall level of methodological accuracy, each study was assessed using checklist criteria and was assigned a quality rating of high, moderate, or low. From the 24 studies that were selected for the full review, 21 of them were found “high quality” and 3 of them were found “moderate quality” by the rating scale guidance. All 24 studies were included in the review to further investigate the results. The quality ratings and the comments for each article can be seen in Table 1.

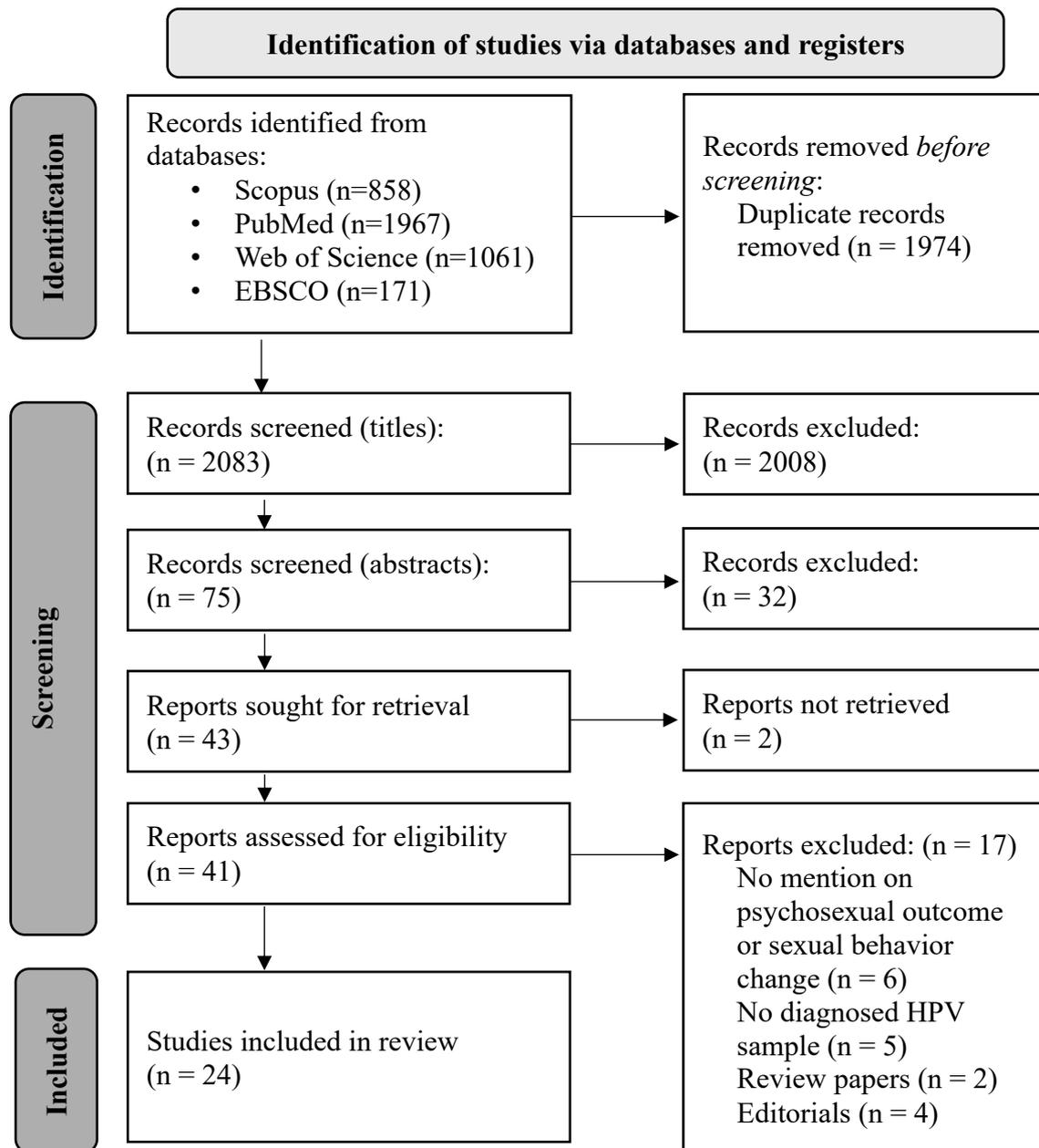


Figure 1: Flow diagram of the article selection process
 (Adapted from: <https://www.prisma-statement.org/prisma-2020-flow-diagram>)

Table 1: *Quality Appraisal Ratings of Included Articles*

Author (year)	Study design	Appraisal tool used	Criteria met	Quality rating	Overall appraisal	Comments
Aker et al. (2023)	Quantitative	JBI	6/8	Moderate	Include	Clear design but missed information on confounding variables
Alay et al. (2019)	Quantitative	JBI	8/8	High	Include	Clear design and analysis
Bennett et al. (2022)	Qualitative (Interviews)	CASP	9/10	High	Include	Detailed analysis on the themes from the interviews but small sample size
Bennett et al. (2021)	Quantitative	JBI	8/8	High	Include	Longitudinal design strengthening correlations
Bruno et al. (2024)	Quantitative	JBI	8/8	High	Include	Coherent design and large sample size
Caruso et al. (2019)	Quantitative	JBI	6/8	Moderate	Include	Coherent design but not an elaborate discussion part and no mention to confounding variables
Colón-Valentín (2022)	Quantitative (cross-sectional)	JBI	7/8	High	Include	Elaborate research methodology and clear discussion
Çelikkol et al. (2023)	Quantitative	JBI	8/8	High	Include	Large sample size and clear methodology
Ekmez & Ekmez (2022)	Quantitative	JBI	5/8	Moderate	Include	Not evident research design
Ferenidou et al. (2012)	Quantitative	JBI	7/8	High	Include	Evident research design, strong discussion
Gürkan & Gürbüz (2022)	Quantitative (cross-sectional)	JBI	8/8	High	Include	Coherent research design but no mention to ethics
Jeng et al. (2010)	Qualitative	CASP	9/10	High	Include	Evident themes
Keleş et al. (2023)	Quantitative (cross-sectional)	JBI	8/8	High	Include	Large sample size and clear design
Kurt & İlgen (2020)	Quantitative	JBI	8/8	High	Include	Comprehensive analysis
Leite et al. (2019)	Quantitative	JBI	7/8	High	Include	Unique view in subject
Mercan et al. (2019)	Quantitative (cross-sectional)	JBI	8/8	High	Include	Validated tool for measurement
Nagele et al. (2016)	Mixed design	MMAT	23/27	High	Include	Good combination of research tools

Nia et al. (2022)	Quantitative	JBI	7/8	High	Include	Comprehensive analysis
Sakin et al. (2020)	Quantitative (cross-sectional)	JBI	7/8	High	Include	Adequate justifications
Santos et al. (2020)	Quantitative (longitudinal)	JBI	8/8	High	Include	Strength in causal interpretations
Tehrani et al. (2024)	Quantitative (cohort)	JBI	8/8	High	Include	Appropriate study design
Türkmen & Kutsal (2023)	Quantitative	JBI	6/8	High	Include	Comparison group criteria not fully evident
Wang et al. (2024)	Quantitative (cross-sectional)	JBI	8/8	High	Include	Very detailed and elaborate research design
Yakut & Ekici (2024)	Quantitative	JBI	8/8	High	Include	Relatively limited sample size

Data Synthesis

The extracted data from the selected articles were combined using a narrative synthesis. This method was selected because of the diversity and heterogeneity of the data. Due to these reasons, a meta-analysis was not possible to pursue. Using the guide from the Economic and Social Research Council (Popay, 2006), a framework was established for narrative synthesis. The elements used are as follows: a) creating a preliminary synthesis of findings of included studies, b) investigating the link within and between these studies, c) evaluating the robustness and the strength of the synthesis. Groups and clusters were developed using the results from the studies.

The qualitative studies were analyzed thematically, and they were integrated into the findings from the narrative approach.

Table 2: Summary Table of Included Articles

Reference	Sample	Outcome measured	Data collection material	Time of data collection	Population	Comparison group
Aker et al., 2023 (Turkey)	N=274; Female; Age=30+ years	Sexual function: desire, arousal, lubrication, orgasm, satisfaction and pain; anxiety	Questionnaire (Female Sexual Function Index, Beck Anxiety Inventory)	The time that they tested positive for HPV Next: 2 month and 6 month follow ups	Patients who tested positive for HPV using the Papanicolaou test plus liquid-based cervical cytology within a community-based national cervical cancer screening program in a tertiary university hospital between July 2020 and December 2021	Group 1: HPV 16/18 with normal cytology Group 2: HPV 16/18 with abnormal cytology) Group 3: other high-strain HPV with normal cytology Group 4: other high-strain HPV with abnormal cytology
Alay et al., 2019 (Turkey)	N= 80; Female; Age=30+ years	Sexual function: desire, arousal, lubrication, orgasm, satisfaction and pain; anxiety	Questionnaire (Female Sexual Function Index, Beck Anxiety Inventory)	First clinical visit and 2 months after of diagnosis	Women referred to the gynecology outpatient clinic upon being diagnosed with an HPV infection by the community-based cervical cancer screening program.	Group 1: HPV 16/18-positive and normal cytology Group 2: HPV 16/18-positive and abnormal cytology Group 3: non-16/18 HPV-positive and abnormal cytology Group 4: non-16/18 HPV- positive and normal cytology
Bennett et al., 2022 (UK)	N=21; Female; Age=24-65 years	Emotional responses, psychosocial responses, disclosing an HPV infection to others and, feelings about future sexual relationships and disclosure	Semi-structured Interviews	One interview between June and July 2020	Self-reported testing HPV-positive in the context of cervical screening in the last 12 months.	HPV positive individuals only
Bennett et al., 2021 (UK)	N=1133; Female; Age=24-65 years	Psychosexual distress	Questionnaire	At the time of diagnosis, then 6 and 12 months after	Women who had taken part in the NHS Cervical Screening Program.	Group 1: HPV positive with normal cytology Group 2: HPV positive with abnormal cytology Group 3: HPV negative
Bruno et al., 2024 (Italy)	N=131; Female; Age=25-40+ years	Sexual function: desire, arousal, lubrication,	Questionnaire (Female Sexual Function Index)	Questionnaire was administered before LEEP and	Women who underwent Loop Electrosurgical Excisional Procedure (LEEP) for the	HPV positive individuals only

Reference	Sample	Outcome measured	Data collection material	Time of data collection	Population	Comparison group
		orgasm, satisfaction and pain		6 months after the procedure	treatment of cervical intraepithelial neoplasia 3 (CIN 3)	
Caruso et al., 2019 (Italy)	<i>N</i> =121; Female; Age=18-35 years	Sexual function: desire, arousal, lubrication, orgasm, satisfaction and pain	Questionnaire (Female Sexual Function Index)	Questionnaire was administered before diagnosis and 3 months after the diagnosis was communicated to the patient	Women attending a gynecological clinic	Group 1: women who were HPV positive Group 2: women who were HPV negative
Colón-Valentín et al., 2022 (Puerto Rico)	<i>N</i> =205; Female; Age=21-65 years	Sexual satisfaction, anxiety, depression, self-esteem	Questionnaire, Interview	One measurement for each of the 4 questionnaires from April 2019 to December 2019.	Women who received gynecological care at the University of Puerto Rico (UPR) clinics	Group 1: women who are HPV positive result Group 2: women who are HPV negative
Çelikkol et al., 2023 (Turkey)	<i>N</i> =344; Female; Mean age=37.2 ± 8.2 years	Sexual function: desire, arousal, lubrication, orgasm, satisfaction and pain	Questionnaire (Female Sexual Function Index)	Group 1: one at the time of diagnosis and one follow up 1 year later Group 2: at the time of diagnosis, 4 weeks after colposcopy, and 8 weeks after LEEP	Women who received positive results for HPV testing	Group 1: women infected with HPV types other than 16–18 and those with normal cytology Group 2: Patients with HPV 16–18 or cytological abnormalities who underwent colposcopy and if necessary LEEP
Ekmez & Ekmez, 2022 (Turkey)	<i>N</i> =126; Female, Male (couples); Age=30+ years	Sexual function: desire, arousal, lubrication, orgasm, satisfaction and pain; male sexual function and satisfaction; anxiety	Questionnaire (Female Sexual Function Index, International Index of Erectile Function, Premature Ejaculation Diagnosis Tool,	At the time of diagnosis and one month later	Women admitted to gynecology outpatient polyclinic who participated in the cervical cancer screening program with partners	HPV positive women and their partners only

Reference	Sample	Outcome measured	Data collection material	Time of data collection	Population	Comparison group
			Beck Anxiety Inventory)			
Ferenidou et al., 2012 (Greece)	<i>N</i> =51; Female; Mean age=36 years	Emotional response, mental health, sexual function	Questionnaire	Once after diagnosis	Patients who proceeded to the gynecological outpatient clinic of “Aretaicion” Hospital, Athens, during 2008-2009	HPV positive individuals only
Gürkan & Gürbüç, 2022 (Turkey)	<i>N</i> =213; Female; Age=20-45 years	Sexual function: desire, arousal, lubrication, orgasm, satisfaction and pain; anxiety; depression; hopelessness	Questionnaire (Female Sexual Function Index, Beck Depression Inventory (BDI), Beck Anxiety Inventory (BAI), and Beck Hopelessness Scale (BHS))	At the time of diagnosis	Women who admitted at Medistate Hospital Gynecology and Obstetrics Clinic between February 2021 and May 2022	Group 1: HPV negative Group 2: HPV negative
Jeng et al., 2010 (Taiwan)	<i>N</i> =20; Female; Age=20-60 years	Patient's relationship with partner after being diagnosed, effects on sexual relationship	Semi-structured Interviews	After being diagnosed	Women who admitted at gynecological outpatient clinic of a university- based hospital in Taipei with partners	HPV positive individuals only
Keleş et al., 2023 (Turkey)	<i>N</i> =575; Female; Age=19-72 years	Sexual functions and libido levels; anxiety; depression	Questionnaire (Beck anxiety inventory, the Beck depression inventory, and the Libido scoring system scales)	After being diagnosed	Women attending the outpatient gynecologic clinic diagnosed with HPV for the first time	Group 1: HPV positive Group 2: HPV negative
Kurt & Ilgen, 2020 (Turkey)	<i>N</i> =108; Female; Age=20-50 years	Sexual function: desire, arousal, lubrication, orgasm, satisfaction and pain	Questionnaire (Female Sexual Function Index)	After being diagnosed	Women who visited the gynecologic oncology clinic	Group 1: HPV positive Group 2: HPV negative

Reference	Sample	Outcome measured	Data collection material	Time of data collection	Population	Comparison group
Leite et al., 2019 (Portugal)	<i>N</i> =194; Female; Mean age=39.8 years	Emotional responses, distress, sexual satisfaction	Questionnaire	Once after diagnosis	Women being followed in two major hospitals	HPV positive individuals only
Mercan et al., 2019 (Turkey)	<i>N</i> =133; Female; Mean age=35.5 years	Sexual functioning: sexual desire, arousal, genital response lubrication, orgasmic experience and orgasmic satisfaction; anxiety; depression	Questionnaire (The Arizona Sexual Experience Scale, Beck Depression Inventory (BDI), Beck Anxiety Inventory (BAI))	Evaluated for 6 weeks after diagnosis	Patients in the gynecology outpatient clinic of VKV American Hospital, Istanbul	Group 1: HPV positive Group 2: HPV negative
Nagele et al., 2016 (Austria)	<i>N</i> =209; Female; Mean age=45 years	Sexual activity, psychosexual distress, fear of progression	Questionnaire	Once after diagnosis	Women with suspect premalignant gynecologic HPV-related lesions recruited from a university hospital-based colposcopy clinic	Group 1: suspect precancerous lesion of cervix Group 2: suspect precancerous lesion of vagina Group 3: suspect precancerous lesion of vulva
Nia et al., 2022 (Iran)	<i>N</i> =105; Male; Mean age=30.86±7.3 years	Sexual function, sexual quality of life	Questionnaire	Once after diagnosis	Men with GWs in the dermatology clinic of Shahid Faghihi Hospital in Shiraz University of Medical Sciences, Iran	HPV positive individuals only
Sakin et al., 2020 (Turkey)	<i>N</i> =300; Female; Age=18-70 years	Sexual function: desire, arousal, lubrication, orgasm, satisfaction and pain	Questionnaire (The Arizona Sexual Experience Scale, Female Sexual Function Index)	At diagnosis, then after 2 weeks, 4 weeks, 3 months, 6 months and a year	Women who received HPV screening at a hospital between August 1 st 2017, and November 1 st , 2017	Group 1: HPV positive Group 2: HPV negative
Santos et al., 2020 (Portugal)	<i>N</i> =209 to 105 remaining; Female;	Sexual satisfaction, emotional expression with	Questionnaire (Sexual Satisfaction Index,	At diagnosis, six months and 1 year after	HPV-diagnosed female patients with a partner	HPV positive individuals only

Reference	Sample	Outcome measured	Data collection material	Time of data collection	Population	Comparison group
	Age=20-65 years	partners, the quality of the sexual partnership, dyadic adjustment,	Revised Dyadic Adjustment Scale)			
Tehrani et al., 2024 (Iran)	<i>N</i> =250; Female; Age=18-45 years	Sexual function: desire, arousal, lubrication, orgasm, satisfaction and pain	Questionnaire (Female Sexual Function Index, Sexual Quality of Life-Female Scale)	At diagnosis, six months and 1 year after	Married women who infected with HPV from colposcopy clinic of Arash women hospital	HPV positive individuals only
Türkmen & Kutsal, 2023 (Turkey)	<i>N</i> =77; Male; Mean age=39.7±10.3 years	Sexual function, depression, anxiety	Questionnaire	Once after diagnosis	Male patients who applied to the XXX Hospital and diagnosed with genital warts	Group 1: small sized genital warts Group 2: larger sized genital warts
Wang et al., 2024 (China)	<i>N</i> =531; Female; Age=20-70 years	Sexual function: desire, arousal, lubrication, orgasm, satisfaction and pain; anxiety	Questionnaire (Female Sexual Function Index, SAS Anxiety Scale)	At the time of diagnosis	Women at the gynecological clinics of the three selected hospitals in China	Group 1: HPV positive (later divided to 4) Group 2: HPV negative
Yakut & Ekici, 2024 (Turkey)	<i>N</i> =165; Male; Mean age=33.5 years	Erectile function, orgasmic function, sexual desire, intercourse satisfaction, and overall satisfaction; obsessive beliefs, anxiety	Questionnaire (International Index of Erectile Function-15, Obsessive Beliefs Questionnaire-44, State-Trait Anxiety Inventory)	At the time of diagnosis	HPV-positive men from a urology outpatient clinic, healthy men employed at the hospital.	Group 1: HPV positive Group 2: HPV negative

Results

Search Results

After the removal of the duplicates, the remaining were 2083 articles from the keyword search. Following the elimination procedures from titles and abstracts, 41 full texts were reviewed. 17 of them were excluded from the study subsequent to the full review, which yielded 24 articles in total that were included in this review. Out of these 24 articles, 11 were conducted in Turkey (Aker et al., 2023; Alay et al., 2019; Çelikkol et al., 2023; Ekmez & Ekmez, 2022; Gürkan & Gürbüz, 2022; Keleş et al., 2023; Kurt & Ilgen, 2020; Mercan et al., 2019; Sakin et al., 2020; Türkmen & Kutsal, 2023; Yakut & Ekici, 2024), 2 in Italy (Bruno et al., 2024; Caruso et al., 2019), 2 in Portugal (Leite et al., 2019; Santos et al., 2020), 2 in Iran (Nia et al., 2022; Tehranian et al., 2024), 2 in the United Kingdom (Bennett et al., 2021; Bennett et al., 2022), 1 in Taiwan (Jeng et al., 2010), 1 in Puerto Rico (Colón-Valentín et al., 2022), 1 in China (Wang et al., 2024), 1 in Greece (Ferenidou et al., 2012), and 1 in Austria (Nagele et al., 2016). 21 of the studies were quantitative (Aker et al., 2023; Alay et al., 2019; Bennett et al., 2021; Bruno et al., 2024; Caruso et al., 2019; Colón-Valentín et al., 2022; Çelikkol et al., 2023; Ekmez & Ekmez, 2022; Ferenidou et al., 2012; Gürkan & Gürbüz, 2022; Keleş et al., 2023; Kurt & Ilgen, 2020; Leite et al., 2019; Mercan et al., 2019; Nia et al., 2022; Sakin et al., 2020; Santos et al., 2020; Tehranian et al., 2024; Türkmen & Kutsal, 2023; Wang et al., 2024; Yakut & Ekici, 2024), 2 were qualitative (Bennett et al., 2022; Jeng et al., 2010), and 1 used mixed methods (Nagele et al., 2016). The majority of the studies focused only on women (n=21); however, some literature on men was also found (n=3). The studies were conducted between 2010 and 2024. Verified measures for data analysis in quantitative studies included: for women, the questionnaires of “Female Sexual Function Index, Libido Scoring System, The Arizona Sexual Experience Scale, Sexual Satisfaction Index”. For men, these questionnaires were the “Index

of Erectile Function and Sexual Quality of Life – Men”. The emotional aspect of the quantitative studies most commonly used the questionnaires of the “Beck Anxiety Inventory and the Beck Depression Scale”. The aspects of the sexual function measures were most frequently divided into the subsections of desire, arousal, lubrication, orgasm, satisfaction, and pain. The 2 qualitative studies used semi-structured interviews (Bennett et al., 2022; Jeng et al., 2010). Most of the studies were a comparison between HPV positive and HPV negative individuals. The psychological effects that were focused on the most were anxiety, depression, and distress.

Sexual Functioning Changes

Six quantitative studies focused on sexual functioning as the single dependent variable (Bruno et al., 2024; Caruso et al., 2019; Çelikkol et al., 2023; Kurt & Ilgen, 2020; Sakin et al., 2020; Tehranian et al., 2024). Sexual function was measured by using questionnaires that evaluated the overall variable under subsections of desire, arousal, lubrication, orgasm, satisfaction, and pain. Two of them compared HPV positive and HPV negative women and used the Female Sexual Function Index as the measurement tool (Caruso et al., 2019; Kurt & Ilgen, 2020). One of the studies applied the questionnaire before diagnosis and 3 months after the diagnosis, which resulted in the significant worsening of HPV positive women’s sexual functioning while HPV negative women had improved scores in the FSFI (Caruso et al., 2019). On the contrary, the second study showed minimal and non-significant differences between the 2 groups (Kurt & Ilgen, 2020). The other two studies illustrated the time influence after diagnosis on women’s sexual functioning (Sakin et al., 2020; Tehranian et al., 2024). While one of them detected no significant difference after and following diagnosis (Sakin et al., 2020), the other showed improvements in sexual functioning following a treatment plan (Tehranian et al., 2024). However, this improvement may be due to the confounding variable of “marriage duration” in the study mentioned, since it covered only married women. The other two studies

that focused on the time influence following a diagnosis took another point of view, following women who were HPV positive and had to undergo the LEEP procedure (Bruno et al., 2024; Çelikkol et al., 2023). In one of them, that was done on 131 women, nearly 60% reported significant worsening of FSFI scores, fear of sexual intercourse, and worsening of intimacy with partner(s) (Bruno et al., 2024). The other study that was done on 340 women had similar results with worsening of FSFI after the diagnosis and then a gradual decrease after LEEP (Çelikkol et al., 2023).

Effects on Anxiety, Depression, and Sexual Functioning

Other quantitative studies, instead of solely measuring sexual function after an HPV diagnosis, brought a more psychological view by combining emotional responses with sexual functioning. Psychological responses that were measured most frequently were anxiety, followed by depression. Feelings of anxiety and depression are recurrent when dealing with an infection. In consideration of the sexually transmitted nature of HPV, this anxiety can easily reflect on and harm the sexual functioning of individuals with HPV. Anxiety and depression were reported jointly in four studies, comparing HPV-positive and HPV-negative women (Colón-Valentín et al., 2022; Gürkan & Gürbüz, 2022; Keleş et al., 2023; Mercan et al., 2019). Three of them used the Beck Depression and Beck Anxiety Inventory for measuring emotional responses (Gürkan & Gürbüz, 2022; Keleş et al., 2023; Mercan et al., 2019), and all four of them used different tools for measuring sexual function. Gürkan & Gürbüz (2022), including 213 women in their study, detected significantly higher levels of anxiety and depression in the HPV positive group, which was correlated with their low records of FSFI scores. Contrary, the other three studies that merged anxiety and depression with sexual functioning did not find any significant relationship between the two variables. (Colón-Valentín et al., 2022; Keleş et al., 2023; Mercan et al., 2019) One study found increased anxiety levels in the HPV-positive group

(Colón-Valentín et al., 2022), the other two found elevated depression levels (Keleş et al., 2023; Mercan et al., 2019), but the association was not significant with sexual functioning scores.

Two studies centralized anxiety and sexual function with HPV positivity (Ekmez & Ekmez 2022; Wang et al., 2024). Similarly to Gürkan & Gürbüz (2022), Ekmez & Ekmez (2022) and Wang et al. (2024) found a significant correlation between HPV positivity, elevated levels of anxiety and decrease in sexual function; in studies conducted on Turkish women and Chinese women respectively.

Two of the studies (Aker et al., 2023; Alay et al., 2019) carried out similar research designs with a comparison of anxiety levels on HPV positive women divided into four groups. They distinguished the type of virus (high risk: 16/18 or low risk: other) and the cytology (normal or abnormal). Although they had similar research designs and populations, the two studies found different results. While Aker et al. (2023) detected a significant decrease in sexual function and a significant increase in anxiety levels of high-risk HPV positive women, Alay et al. (2019) found no correlation.

Other Emotional Complications and Psychosexual Impact

Other studies, rather than addressing anxiety or depression, focused on other emotional complications like distress or fear paired with sexual functioning. Three of them reported a strong correlation between negative emotional responses and a decrease in sexual functioning (Bennett et al., 2022; Ferenidou et al., 2012; Leite et al., 2019) while one reported no significant relationship (Nagele et al., 2016). Ferenidou et al. (2012) noted in a study on 51 women that 76% of them rated their anxiety as “quite or very much,” and nearly half of them reported feelings of guilt and anger. In addition, half of the women declared less sexual desire and less frequency of sex.

Changes in Sexual Relationship and Effect on Partner Behavior

Other studies addressed the influence of couples' relationships and the emotional impact on their sexual life after receiving an HPV diagnosis (Santos et al., 2020; Jeng et al., 2010; Bennett et al., 2022). One longitudinal study in Portugal focused on the dyadic adjustment after an HPV diagnosis between couples and the impact it had on their sexual satisfaction (Santos et al., 2020). After diagnosis, there was a significant decrease in sexual satisfaction between couples and increased anxiety around sexual intimacy. Over time, there were improvements in dyadic adjustment; however, sexual satisfaction was below the baseline limit. Jeng et al. (2010) conducted interviews with 20 Taiwanese women who were HPV-positive. Half of them reported a decline in sexual activity due to emotional distress, discomfort, and fear of transmission. This study also emphasized the role of the stigmatizing effects of HPV on women's emotional responses. Bennett et al. (2022) also put an emphasis on stigma while conducting a qualitative study with semi-structured interviews. The article noted that an HPV diagnosis caused reactions such as anger and fear in women and progressed to self-stigma or self-blame. Some women in this study mentioned a lower frequency of sex; the responses were dependent on how women conceptualized HPV.

Psychosexual Impact of HPV on Males

On a different note, even though limited, three studies mentioned male psychosexual function with HPV-positivity. HPV in males can be diagnosed with the presence of genital warts, and the sexual function can be measured with the tools of the International Index of Erectile Function or with the Index of Premature Ejaculation. Two of these studies reported high anxiety and worse erectile function in men with genital warts (Nia et al., 2022; Türkmen & Kutsal, 2023). The other study detected elevated anxiety and obsessive beliefs but no difference in the overall sexual function (Yakut & Ekici, 2024). However, when the same study

approached patients on an individual level, it revealed that high anxiety predicted more sexual dysfunction in HPV positive males.

Discussion

This review combined the literature on the psychosexual impact of HPV. It included studies from different methods, countries, and populations. Due to the heterogeneity of the literature, a single result from this review was hard to determine. The diverse methods and tools to measure psychosexual impact made it challenging to compare the studies. On the contrary, the differences in the studies gave a view of the psychosexual impact of HPV from different angles and regions. The association between HPV diagnosis and sexual dysfunction was usually recurrent. In women, it was measured through the validated tool of the Female Sexual Function Index, with the subsections of desire, arousal, lubrication, orgasm, and satisfaction. The measurements in consultation visits of women usually showed worsening of scores over time, suggesting that the theme of HPV positivity and sexual dysfunction is present even after a considerable amount of time following the diagnosis (Aker et al., 2023; Caruso et al., 2019; Ekmez & Ekmez, 2022; Santos et al., 2020). Another recurrent theme was the coupling of emotional measurements with sexual function in HPV positive groups. Through the studies, the increase was shown most frequently in anxiety. Although there was a general trend of worsening of sexual functions and an overall increase of distress (Aker et al., 2023; Bennett et al., 2021; Ekmez & Ekmez, 2022; Gürkan & Gürbüz, 2022; Sakin et al., 2020; Ferenidou et al., 2012; Liete et al., 2019; Nia et al., 2022; Türkmen & Kutsal, 2023) not all studies found significant correlations between the two (Alay et al., 2019; Colón-Valentín et al., 2022; Keleş et al., 2023; Mercan et al., 2019; Nagele et al. 2016; Yakut & Ekici, 2024).

Fewer studies were conducted on the effect on male sexual function (Nia et al., 2022; Türkmen & Kutsal, 2023; Yakut & Ekici, 2024). According to those few, males can also be impacted by an HPV diagnosis on a psychosexual note. However, it would be wrong to

generalize it to the population because of the few number of studies in the literature. This suggests the gap in research about the effects of HPV on males.

Some studies combined a psychosocial view with a psychosexual approach on HPV, suggesting that emotional distress can also be affected by the external environment and relationships, in turn affecting sexual function (Bennett et al., 2021; Tehranian et al., 2024; Jeng et al., 2010). Feelings that appear with stigmatization and self-blame were shown to influence the sexual functioning of women (Bennett et al., 2021; Jeng et al., 2010). These studies also emphasized the role of the partner in dealing with and sexually adjusting to the illness.

Few studies involved men or non-heterosexual populations, and many were cross-sectional, which limits the ability to interpret causality. From both the two previous reviews and this one about the psychosexual impact of HPV, the general trend of negatively affected sexual functioning and mental health can be detected (Bennett et al., 2019; Sikorska et al., 2023). Sikorska et al. (2023) illustrated a more profound negative effect (89% of studies) of an HPV diagnosis on sexual functioning; however still a single conclusion was difficult to draw. For a more conclusive study, a longitudinal approach with a greater number of participants should be aimed at. In the clinical environment, HPV should be treated more holistically, considering the psychological and psychosexual also the social effects. (Galeshi et al., 2025) Acknowledging anxiety, especially sexual, can improve the quality of life of patients dealing with this virus and lead to better medical outcomes.

Limitations

The variability in the literature considering tools, methods, and participants limited the possibility of conducting a meta-analysis. A limited number of studies were included with certain populations (males), raising the challenge of generalizing to the population. HPV research has primarily focused on women, due to the extensive spread of cervical cancer. Thus, the underrepresented populations of males or LGBTQ+ individuals create limitations. These

groups were not focused on as much as women, due to not having a routine screening program, or in the case of LGBTQ+ individuals, the screening or vaccination programs being more heterosexual or female-focused. (Hao et al., 2021; Zou et al., 2022). Some countries were dominantly represented in research (Turkey), which might lead to overlapping population demographics, confounding with the generalizability. The overrepresentation of the Turkish population in literature may be caused by the investment Turkey made into HPV related research, understanding prevalence, and prevention. Extensive studies, including multiple hospitals in Turkey, created a considerable amount of literature (Dursun et al., 2013).

Conclusion

This systematic review emphasizes the psychosexual impact of HPV. The sexually transmitted nature, contagiousness, stigmatization in society, and causal relation with cancer made HPV a relevant infection to investigate from the angle of psychosexual aspects. Presented through the studies, HPV was usually associated with worse sexual functioning and high levels of anxiety, depression, or distress. However, the trend of worse sexual functioning and high emotional distress was not always occurring, and it was not always correlational with HPV positivity. Due to the diverse studies, it was challenging to conclude on a single point. This review also emphasizes the need to conduct further analyses on this topic, considering the increased prevalence of HPV, especially in the recent decade. Psychosexual impacts should be a more relevant topic since the direct effect they have on an individual's well-being, mental and physical health.

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