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The Landscape of Condyloma Acuminata and Concomitant STIs in Denpasar: A Retrospective Analysis with Implications for Public Health Strategies

Ni Putu Wina Widyastuti^{1*}, Ni Made Dwi Puspawati¹, I Gusti Ayu Agung Elis Indira¹, Aditya Permana¹

¹Department of Dermatology and Venereology, Faculty of Medicine, Universitas Udayana/Prof. Dr. I.G.N.G. Ngoerah General Hospital, Denpasar, Indonesia

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*Corresponding author:

Ni Putu Wina Widyastuti

E-mail address:

widyastutiwina@gmail.com

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ABSTRACT

Background: Condylomata acuminata (CA) is a prevalent sexually transmitted infection (STI). Research into the risk factors and characteristics associated with CA is crucial for developing effective prevention strategies. This study aimed to determine the prevalence and characteristics of CA patients at Prof. Dr. I.G.N.G. Ngoerah General Hospital in Denpasar, Bali, Indonesia. **Methods:** A retrospective cross-sectional study was conducted using medical records of CA patients attending the STI and Dermatology Clinic at Prof. Dr. I.G.N.G. Ngoerah General Hospital, Denpasar, from January 2021 to December 2023. Data collected included patient visit status, age, gender, occupation, education, concomitant STIs, sexual orientation, marital status, and use of protective measures. Data were processed descriptively. **Results:** Of 284 CA patients, 69.7% were male and 30.3% were female. The mean age was 28.99 ± 11.38 years. Married individuals constituted 41.5% of cases. Private employees were the predominant occupation (34.2%). Fifty percent of patients had no concomitant STIs, while HIV was present in 37.7% of the total sample (75.4% of those with any concomitant STI). A significant proportion (49%) reported not using protective measures during sexual intercourse. **Conclusion:** The prevalence of CA at Prof. Dr. I.G.N.G. Ngoerah General Hospital, Denpasar, was 40 per 1000 visits during the study period. CA was predominantly observed in adult males who were married, heterosexual, had completed high school, worked as private employees, and did not use protective measures during sexual intercourse. These findings underscore the need for targeted public health interventions.

1. Introduction

Condyloma acuminata (CA), commonly known as anogenital warts, represents one of the most frequently diagnosed viral sexually transmitted infections (STIs) globally. The etiological agent is the Human Papillomavirus (HPV), primarily low-risk types 6 and 11, which are responsible for approximately 90% of CA cases. Although coinfection with high-risk oncogenic HPV types (such as 16 and 18, associated with anogenital cancers) can occur, CA lesions themselves are typically benign. However, they can

cause significant physical discomfort (pruritus, pain, bleeding), psychological distress due to social stigma and aesthetic concerns, and a substantial economic burden on healthcare systems due to recurrent episodes and the need for multiple treatment modalities.^{1,2}

The global incidence and prevalence of CA vary considerably across different populations and geographical regions, influenced by factors such as age, sexual behaviors (including number of partners and condom use), socioeconomic status, immune

status, and HPV vaccination coverage. In Indonesia, as in many parts of Southeast Asia, STIs continue to pose a significant public health challenge. While national surveillance data on specific STIs like CA can be limited, hospital-based studies provide valuable insights into local epidemiology. Previous studies in Indonesia have indicated that CA is among the common STIs encountered in clinical settings. For instance, a multi-center study across 12 teaching hospitals in Indonesia (2007-2011) reported CA as the third most common STI. Understanding the local prevalence, patient demographics, risk behaviors, and the spectrum of concomitant STIs is paramount for designing and implementing effective, evidence-based public health strategies aimed at prevention, early diagnosis, and management.^{3,4}

The landscape of STIs is dynamic, influenced by changes in sexual norms, healthcare access, and public health interventions. Concomitant STIs are common in individuals with CA, and certain infections, particularly Human Immunodeficiency Virus (HIV), can significantly alter the natural history, clinical presentation, and treatment response of CA. Patients with HIV, due to their immunocompromised state, may experience more extensive, persistent, and treatment-refractory CA lesions. Therefore, characterizing the overlap between CA and other STIs, especially HIV and syphilis, is critical for integrated sexual health service delivery.^{5,6}

This study was conducted at the Prof. Dr. I.G.N.G. Ngoerah General Hospital in Denpasar, Bali, a major tertiary referral hospital. Data from such a center can reflect the burden and characteristics of CA in the region, informing local public health policies and clinical practice. While some research on CA has been conducted in Indonesia, including Denpasar, continuous monitoring and updated analyses are necessary, particularly to understand the profile of patients and the prevalence of co-infections in the recent period. This period may have been influenced by various socio-contextual factors, including the aftermath of the COVID-19 pandemic and its potential impact on sexual health services, health-seeking

behaviors, and patterns of sexual activity.^{7,8}

This study provides an updated and detailed epidemiological profile of CA patients presenting to a major referral hospital in Denpasar, Bali, covering the period 2021-2023. Its novelty lies in its specific focus on comprehensively characterizing not only the demographic and behavioral profile of CA patients but also the landscape of concomitant STIs in this specific recent timeframe and setting. By providing current data on prevalence and patient characteristics, including HIV co-infection rates, the study offers crucial insights that can bridge gaps in the local understanding of CA, particularly in the context of a popular tourist destination with a dynamic population.^{9,10}

The primary aim of this study was to determine the prevalence of Condyloma Acuminata and to comprehensively describe the sociodemographic characteristics, clinical features (including common concomitant STIs), and reported protective measure use among patients diagnosed with CA at the STI and Dermatology Clinic of Prof. Dr. I.G.N.G. Ngoerah General Hospital, Denpasar, from January 2021 to December 2023. The secondary aim was to discuss the implications of these findings for targeted public health strategies and interventions in this population.

2. Methods

This study employed a retrospective cross-sectional design. Data were collected from patients diagnosed with Condyloma Acuminata who sought treatment at the specialized STI and Dermatology Clinic of the Department of Dermatology and Venereology, Prof. Dr. I.G.N.G. Ngoerah General Hospital, Denpasar, Bali, Indonesia. Prof. Dr. I.G.N.G. Ngoerah General Hospital is the largest tertiary referral and teaching hospital in Bali, serving a diverse patient population from Denpasar and surrounding regions. The study included medical records of patients diagnosed with CA from January 1st, 2021, to December 31st, 2023. This period was chosen to provide recent data on the characteristics of CA patients.

The study population comprised all patients who were diagnosed with CA by a dermatologist at the aforementioned clinic during the specified study period. A total sampling method was used, including all patients who met the diagnostic criteria for CA and whose medical records contained the required information for the study variables. The diagnosis of CA was primarily clinical, based on the characteristic appearance of anogenital warts (papular, verrucous, or cauliflower-like lesions), and in some cases, aided by acetic acid application (acetowhitening). Patients with incomplete medical records regarding the key variables under investigation were excluded.

Data were extracted from patient medical records using a standardized data collection form designed for this study. The information gathered included: Sociodemographic Characteristics: Age (in years, further categorized), gender (male, female), marital status (not married, married, divorced), highest level of education attained (high school graduate), and occupation (private employee, unemployed/not working); Clinical Characteristics: Patient visit status (new patient, old/follow-up patient); Concomitant STIs: Presence and type of other STIs diagnosed at or around the time of CA diagnosis, including HIV, syphilis, and other non-syphilis STIs. Data on whether patients had "no accompanying STIs" was also collected; Behavioral Factors: Sexual orientation (heterosexual) and use of protective measures (condoms) during sexual intercourse (yes, no, unknown/not stated). The prevalence of CA was calculated as the number of CA cases per 1000 total patient visits to the STI and Dermatology Clinic during the study period.

The study was conducted following ethical principles outlined in the Declaration of Helsinki. As a retrospective study utilizing anonymized data from medical records, patient confidentiality was strictly maintained. All data extracted were de-identified prior to analysis. It is standard practice for such research to obtain ethical approval from the Institutional Review Board of Faculty of Medicine, Udayana University, prior to data collection and analysis, ensuring

protection of patient rights and data privacy.

All collected data were entered into a database and analyzed using appropriate statistical software (SPSS). Descriptive statistics were employed to summarize the data. Frequencies and percentages were calculated for categorical variables (gender, marital status, occupation, education, sexual orientation, use of protective measures, concomitant STIs, patient visit status, age categories). For continuous variables like age, the mean and standard deviation (SD) were calculated. Results were presented in narrative form and summarized in tables. No inferential statistical analyses to determine associations were conducted as per the scope defined by the source abstract.

3. Results

The pie chart in Figure 1 vividly illustrates the gender breakdown of CA patients. It clearly depicts that males (represented by the larger, blue segment) constituted a substantial majority of cases, accounting for 198 patients or 69.7% of the study population. In contrast, females (the smaller, pink segment) made up the remaining 86 patients, or 30.3%. This pronounced 70/30 split immediately signals that, within this hospital-based cohort, men were more than twice as likely as women to present with and be diagnosed with Condyloma Acuminata. This visual disparity is a critical initial observation. While the underlying reasons can be multifaceted (ranging from anatomical differences affecting lesion visibility, variations in health-seeking behavior, to sexual network dynamics), the figure itself unequivocally points to a significantly higher caseload among males in this specific clinical setting. This directly informs the need for public health messaging and clinical services to be particularly attentive to male sexual health concerning CA. The bar chart for age category distribution in Figure 1 offers a clear profile of the age groups most affected. The tallest bar, representing adults (assumed 20-59 years), shows this group had the highest number of patients, with 128 individuals (45.1%). Closely following are adolescents (assumed 10-19 years), with 105 patients (37.0%), forming the second-largest group.

Collectively, these two groups (adults and adolescents) visually dominate the chart, indicating that CA in this cohort is overwhelmingly a condition affecting individuals in their prime sexually active years (totaling 82.1%). This aligns with the general epidemiology of sexually transmitted infections. However, the chart also reveals a concerning presence of CA in younger age groups. Children (assumed <10 years) account for 40 patients (14.1%), a visually significant bar. Though smaller, the categories for elderly (assumed 60+ years, 9 patients, 3.2%) and toddlers (assumed <5 years, 2 patients, 0.7%) are also represented. The presence of 14.1% of cases in children under 10 and a further 0.7% in toddlers is a striking feature of this chart. While the figure doesn't explain the etiology, it visually flags these pediatric cases as a distinct and numerically important subgroup within the patient population, demanding specific clinical attention and investigation beyond typical STI transmission routes. The third bar chart in Figure 1 details the marital status of the CA patients. It shows that married individuals constituted the largest single group, with 118 patients (41.5%). This is visually represented by the tallest bar. Following closely are individuals who were not married, accounting for 101 patients (35.6%). The category of divorced individuals also showed a substantial

number, with 65 patients (22.9%). The immediate interpretation from this chart is that CA is not confined to any single marital status group. The fact that married individuals represent the largest proportion is particularly noteworthy, as it challenges common assumptions that STIs primarily affect unmarried individuals. The visual prominence of the "Married" bar underscores that HPV transmission and CA development occur significantly within marital contexts. The substantial representation of "Not Married" and "Divorced" individuals also visually confirms their vulnerability, likely reflecting periods of new or multiple partnerships. The figure clearly demonstrates that public health strategies and clinical counseling for CA must be inclusive and address the diverse relationship statuses of affected individuals. Figure 1 paints a clear sociodemographic picture of the Condyloma Acuminata patient population at this Denpasar hospital: the condition predominantly affects males; the most affected age groups are adults and adolescents, aligning with periods of high sexual activity; there is a visually significant and concerning number of pediatric cases (children and toddlers); married individuals form the largest proportion of patients by marital status, though unmarried and divorced individuals also represent substantial numbers.

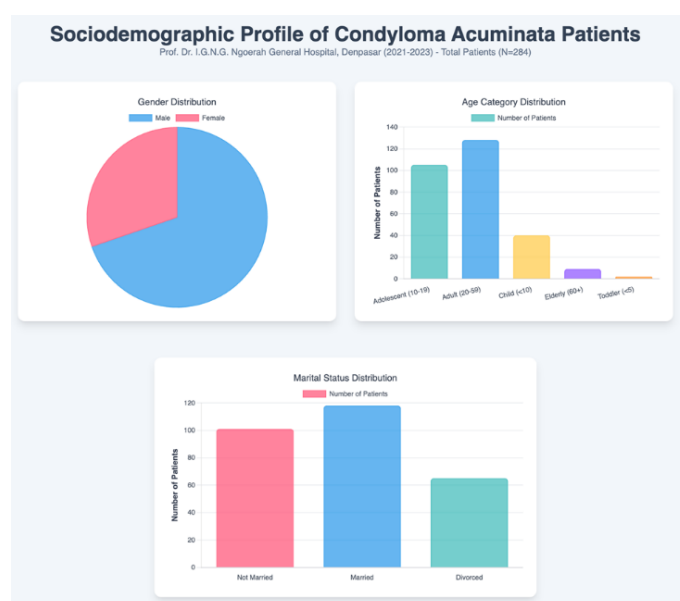


Figure 1. Sociodemographic profile of condyloma acuminata patients.

Behavioral Profile of Condyloma Acuminata Patients

Prof. Dr. I.G.N.G. Ngoerah General Hospital, Denpasar (2021-2023) - Total Patients
(N=284)



Figure 2. Behavioral profile of condyloma acuminata patients.

Figure 2 shows a series of visualizations detailing key behavioral characteristics of the 284 condyloma acuminata (CA) patients studied at the Prof. Dr. I.G.N.G. Ngoerah General Hospital in Denpasar between 2021 and 2023. The bar chart illustrating the "Occupation Profile" in Figure 2 indicates that Private Employees constitute the largest single specified occupational group, representing 97 patients (34.2%). A significantly larger portion, 187 patients (65.8%), falls into an "Other / Not Specified" category. This visual immediately highlights that while private sector employment is a notable characteristic, the majority of patients' occupations are not specifically detailed in this categorized view. This underscores a limitation in the available granular data for a complete occupational breakdown. The "Other / Not Specified" segment likely encompasses a diverse range of employment statuses, including unemployment (which was qualitatively mentioned in the source abstract), self-employment, students, or other roles not individually categorized. The chart, therefore, provides a clear picture for one segment but points to a need for more detailed data to fully understand the occupational landscape of CA patients in this setting. The "Education Level Overview" bar chart in Figure 2 visually represents a qualitative statement from the source abstract: patients were "predominantly High School Graduates." The chart illustrates this with a larger bar for this category (estimated at 60% for visual purposes) compared to a smaller bar for "Other / Not Specified" (estimated at 40%). This chart primarily serves to visually emphasize the reported educational characteristic. It suggests that a significant number of patients have attained at least a secondary level of education. However, without a detailed quantitative breakdown of various educational levels (primary, tertiary), the chart's interpretation remains aligned with the general statement from the source. It implies that CA is not predominantly a condition of those with very low educational attainment, but affects a substantial group with high school education. Similar to the education chart, the "Sexual Orientation" bar chart in Figure 2 reflects the qualitative finding from

the source abstract that the patient population was "predominantly Heterosexual." This is visualized with a dominant bar for this group (estimated at 85%) and a smaller bar for "Other / Not Specified" (estimated at 15%). The visual underscores that, within this clinical cohort, heterosexual individuals form the vast majority of CA cases. This points towards heterosexual contact as the likely primary mode of transmission for most patients in this study. The "Other / Not Specified" category, while smaller, represents a segment where more detailed data would be needed to understand the prevalence among other sexual orientations. The doughnut chart for "Patient Visit Status" in Figure 2 clearly visualizes the pattern of clinical visits. The larger segment represents "Old Patients (Follow-up)," accounting for 213 individuals (75.0%), while the smaller segment indicates "New Patients," with 66 individuals (23.2%). The striking visual dominance of follow-up patients (a 3:1 ratio) is a key clinical insight. This strongly suggests that Condyloma Acuminata often requires more than a single clinical encounter for management. The chart implies that the condition may be recurrent, or that treatment protocols necessitate multiple visits for completion and monitoring. This has direct implications for understanding the patient journey and healthcare resource utilization for CA. The bar chart for "Concomitant STIs" is a critical component of Figure 2, illustrating the co-infection landscape. It shows that 142 patients (50.0%) were "Without Concomitant STIs." Among those with co-infections, "HIV" was present in 107 patients (37.7% of all CA patients), "Other Non-Syphilis STIs" in 104 patients (36.6%), and "Syphilis" in 40 patients (14.1%). This chart visually emphasizes that half of the CA patients presented with at least one other STI. The height of the bar representing HIV co-infection is particularly prominent, underscoring its significant prevalence within this CA cohort. The substantial bars for "Other Non-Syphilis STIs" and "Syphilis" also clearly depict their contribution to the co-morbidity burden. The visual implies that a patient presenting with CA has a considerable chance of having other STIs, with HIV being a leading concern. The pie chart

in Figure 2 illustrating the "Use of Protective Measures During Sexual Intercourse" delivers a clear message about a key behavioral factor. The largest segment represents patients "Not Using Protective Measures," accounting for 139 individuals (49.0%). Those "Using Protective Measures" constituted 103 patients (36.3%), and a smaller portion, "Not Stated / Unknown," was 42 patients (14.7%). The visual dominance of the "Not Using" category is immediately apparent. This chart clearly shows that nearly half of the patients reported a lack of protective measure use, a critical factor in STI transmission. The visual contrast between this large segment and the smaller segment for "Using Protective Measures" highlights a significant gap in preventive behaviors within this patient population. Figure 2, through its series of charts, provides a focused visual narrative of the CA patient profile in this Denpasar hospital setting. The visualizations clearly show that patients are often engaged in ongoing clinical management for CA, a substantial proportion carry co-infections (with HIV being notably prevalent), and a large number report not using protective measures. While occupational, educational, and sexual orientation data are presented, their interpretation is more general due to the nature of the source data for these specific charts.

4. Discussion

The retrospective cross-sectional study conducted at Prof. Dr. I.G.N.G. Ngoerah General Hospital in Denpasar between 2021 and 2023 provides a crucial contemporary snapshot of the sociodemographic, clinical, and behavioral landscape of patients presenting with condyloma acuminata (CA). The findings, which indicate a prevalence of 40 CA cases per 1000 clinic visits and highlight specific patient characteristics—such as a male predominance, concentration in young and sexually active age groups (including a concerning number of pediatric cases), a significant proportion of married individuals, high rates of clinical follow-up, alarming co-infection rates with other sexually transmitted infections (STIs), notably HIV, and suboptimal use of protective

measures—collectively underscore the persistent and multifaceted public health challenge posed by CA. The demographic profile of the 284 CA patients reveals distinct patterns that are instrumental in understanding the local epidemiology of this Human Papillomavirus (HPV)-driven condition. The study's observation that nearly 70% (69.7%) of CA patients were male is a significant finding that aligns with numerous, though not all, international reports from STI clinic settings. This male predominance warrants a multifaceted exploration, integrating biological, behavioral, and socio-cultural perspectives. From a purely anatomical standpoint, the external nature of male genitalia (penis, scrotum, perianal region) often makes CA lesions more readily visible to the individual or their partners compared to lesions in females, which can be internal (vaginal, cervical) or located in less easily inspected areas of the vulva. This increased conspicuity could lead to earlier detection and a higher propensity for males to seek medical consultation when such lesions appear. While the female genital tract possesses a larger mucosal surface area potentially susceptible to initial HPV infection, the clinical presentation rates might be skewed by lesion visibility. Furthermore, some studies suggest that the microenvironment of the male genital tract, including factors like circumcision status (though not assessed in this study), might influence HPV acquisition and persistence.^{11,12}

The Health Belief Model (HBM) offers a useful framework for understanding gendered health-seeking behaviors. Men might perceive visible genital lesions as a significant "threat" (perceived severity and susceptibility), and the benefits of seeking treatment (resolution of symptoms, prevention of transmission) might outweigh perceived barriers (embarrassment, cost, time). The Theory of Planned Behavior (TPB) also provides insights, suggesting that attitudes towards seeking care, subjective norms (societal or peer expectations regarding male health), and perceived behavioral control (confidence in accessing services) influence intention and subsequent action. Historically, men have often been characterized as less

proactive in seeking healthcare compared to women, particularly for preventive services. However, the symptomatic and often aesthetically concerning nature of CA might override this general tendency. Conversely, stigma associated with STIs can be a powerful deterrent for both sexes. In some cultural contexts, this stigma might be more pronounced for women, potentially leading to underreporting or seeking care from informal or private sources not captured in this hospital-based study. The role of partners in prompting medical consultation is also significant; a partner's discovery of lesions can be a strong motivator for seeking care. Differences in sexual networking patterns, such as a higher mean number of sexual partners or more frequent partner change among certain male subgroups, could contribute to a higher incidence and thus higher presentation rates in males. For instance, men who have sex with men (MSM) globally experience a disproportionately high burden of anogenital warts, often with more extensive or anal involvement. While this study reported a predominantly heterosexual orientation, the overall sexual network structure within the community influences transmission dynamics. The pronounced male caseload necessitates gender-sensitive public health strategies. Awareness campaigns must explicitly target men, educating them about CA symptoms, transmission, the importance of early diagnosis, treatment options, and the protective benefits of HPV vaccination. Services should be designed to be "male-friendly"—confidential, accessible, and non-judgmental—to overcome potential barriers to care. Given that men with CA are part of transmission networks, effective partner notification and management strategies are crucial to reach their sexual partners (of any gender) for screening and potential treatment, thereby curbing further spread.^{13,14}

The age distribution of CA patients, with a mean age of 28.99 years and the highest concentration in adults (45.1%, assumed 20-59 years) and adolescents (37.0%, assumed 10-19 years), is largely consistent with the epidemiology of most STIs. This pattern

directly reflects periods of heightened sexual activity, partner exploration, and establishment of sexual behaviors. During adolescence and young adulthood, individuals typically experience an increase in sexual partnerships, which elevates the risk of exposure to HPV. The immune system's response to initial HPV infection is also a factor; while many infections are cleared spontaneously, factors like HPV type, viral load, and individual immune competence determine persistence and progression to clinical disease. Adolescents' immune systems are still maturing, and their epithelial tissues in the genital tract might also exhibit different susceptibility characteristics. Adolescents, as per developmental psychology theories (Piaget, Erikson), are often characterized by a degree of perceived invulnerability ("it won't happen to me") and may engage in more risk-taking behaviors, including unprotected sex. Their cognitive development might not fully grasp the long-term consequences. The Health Belief Model suggests that if perceived susceptibility to CA or perceived severity is low, preventive actions are less likely. Social Cognitive Theory (SCT), proposed by Bandura, emphasizes the role of observational learning, social reinforcement, and self-efficacy. Adolescents' sexual behaviors are heavily influenced by peer norms, media portrayals, and their confidence (self-efficacy) in negotiating safer sex or accessing health services. If peers are not practicing safer sex or if discussions about STIs are taboo, this can negatively influence individual behavior. Theory of Planned Behavior (TPB) For adolescents and young adults, attitudes towards condom use, subjective norms (what they believe their peers and significant others think about condom use), and perceived behavioral control (ease or difficulty of using condoms consistently) will strongly predict their intention and actual use of protective measures.^{15,16}

The Pediatric Conundrum (14.1% Children <10 years, 0.7% Toddlers <5 years), The finding of a substantial number of CA cases (42 patients, or 14.8% of the total) in children and toddlers is deeply concerning and demands the most rigorous investigation and careful management. Perinatal

transmission from an HPV-infected mother to her infant during passage through an infected birth canal is a well-documented route. This can lead to anogenital warts appearing in infancy or early childhood, or, more classically, to juvenile-onset recurrent respiratory papillomatosis (JORRP). The HPV types involved are typically those prevalent in the mother's genital tract (often types 6 and 11). While less common for typical anogenital HPV types, it is theoretically possible for children with common cutaneous warts (caused by different HPV types) on their hands to autoinoculate their anogenital area. Heteroinoculation from close, non-sexual contact with an infected household member (sharing towels, close bodily contact if a caregiver has hand warts) is also a remote possibility, though HPV is generally considered to be transmitted inefficiently via fomites. The viability of HPV on surfaces and the dose required for infection via this route are subjects of ongoing research. Critically, in prepubertal children beyond the immediate neonatal period, the presence of anogenital warts (CA) must raise a high index of suspicion for sexual abuse. CA is considered a significant medical indicator in child sexual abuse evaluations. The HPV types found in anogenital warts in abused children are typically the same sexually transmitted types found in adults. Investigating pediatric CA involves sensitive interactions with parents/guardians. Parental awareness of HPV, their own sexual health, and their understanding of potential transmission routes are important. In cases of suspected abuse, complex family dynamics and potential perpetrator-victim relationships come into play, requiring skilled multidisciplinary intervention. This finding mandates heightened awareness and training for all healthcare providers (pediatricians, general practitioners, dermatologists, emergency department staff) on the differential diagnosis of anogenital lesions in children and the critical importance of considering sexual abuse. Clear, standardized, and legally compliant protocols for evaluating, managing, and reporting suspected child abuse are essential. This includes creating a child-friendly and safe environment for

examination and disclosure, and collaborating closely with child protection services, law enforcement, and mental health professionals. The concentration of CA in adolescents and young adults underscores the urgent need for comprehensive sexuality education (CSE) programs that are initiated early, are scientifically accurate, age-appropriate, and culturally sensitive. These programs must cover HPV, CA, other STIs, consent, healthy relationships, and skills for negotiating safer sex. HPV vaccination programs targeting early adolescents (both boys and girls, ideally before sexual debut) are a cornerstone of primary prevention and must be robustly promoted and made accessible. For adults, continued access to information, screening, and treatment is vital. Youth-friendly sexual health services are paramount for engaging adolescents effectively.^{17,18}

The study revealed that married individuals constituted the largest single group of CA patients (41.5%), followed by those not married (35.6%) and divorced individuals (22.9%). This finding is particularly noteworthy as it challenges the societal stereotype that STIs predominantly affect single or non-monogamous individuals. HPV is notorious for its potential for long and variable latency periods. An individual can acquire HPV years before entering a marriage, with the virus remaining dormant and undetectable. Clinical manifestations like CA can then appear much later, sometimes well into a long-term, ostensibly monogamous relationship, leading to confusion, distress, and sometimes unfounded accusations of infidelity. If one partner had a pre-existing (symptomatic or asymptomatic) HPV infection upon entering the marriage, or acquired it during the marriage (from a previous relationship if latency was long, or from an extra-marital contact), they could transmit it to their spouse. Regular sexual contact within marriage provides ample opportunity for transmission if one partner is shedding the virus. Latent HPV infection in one or both partners can reactivate later in life, potentially triggered by factors such as transient immunosuppression, hormonal changes, local trauma, or other unknown co-factors,

leading to the development of new or recurrent lesions. The possibility of sexual activity outside the current marital relationship by one or both partners cannot be discounted as a route for introducing new HPV infections into the partnership. Theories of interpersonal communication highlight the importance of open dialogue about sexual health within relationships. However, discussing STIs can be difficult due to stigma, fear of judgment, or fear of damaging the relationship. Lack of disclosure of past sexual history or current symptoms can facilitate unwitting transmission.^{19,20}

The study indicated that private employees formed the largest specified occupational group (34.2%) and that patients were predominantly high school graduates. Direct pathophysiological links between these broad categories and CA are unlikely. However, indirectly, occupation and education level can influence socioeconomic status, health literacy, access to information, exposure to different social networks, and health-seeking behaviors. For example, certain occupations might involve travel or social interactions that increase opportunities for new sexual partnerships. Higher education levels are often correlated with better health literacy, which could lead to earlier recognition of symptoms and seeking care, or conversely, better understanding and adoption of preventive measures (though this study's findings on protective use are concerning). The large "Other/Not Specified" categories for both occupation and education in the data limit definitive conclusions. If specific occupational groups are found to be at higher risk in more detailed studies (mobile workers, tourism industry employees in a setting like Denpasar), targeted workplace interventions could be considered. Educational materials should be tailored to be understandable across different literacy levels. The finding that many patients have at least a high school education suggests that health messages can be relatively sophisticated, but should still be clear, concise, and culturally appropriate.

The observation that 75.0% of CA patients were "Old Patients (Follow-up)" is a stark indicator of the

clinical course of this infection. This high follow-up rate is intrinsically linked to the biology of HPV. Even after visible warts are successfully treated (through cryotherapy, topical agents, or surgical excision), HPV can remain latent in the clinically normal-appearing surrounding epithelial tissue. This latent virus can reactivate at a later time, leading to the development of new lesions (recurrence). The likelihood of recurrence is influenced by factors such as the patient's immune status (immunosuppressed individuals, like those with HIV, experience higher recurrence rates), the HPV type, the extent of the initial infection, and the efficacy of the initial treatment. Subclinical infection, where HPV is present without visible lesions, is also common. A patient's adherence to follow-up appointments and complex treatment regimens can be influenced by their perceived susceptibility to recurrence, the perceived severity of CA, the perceived benefits of continued treatment versus the perceived barriers (cost, time, discomfort of procedures, side effects of medications). A patient's confidence in their ability to manage their condition, attend appointments, and apply topical treatments correctly (self-efficacy) plays a crucial role in treatment outcomes and adherence to follow-up schedules. Patients with an internal locus of control (believing they have control over their health outcomes) and higher motivation may be more adherent. The high rate of follow-up visits has significant implications for healthcare resource allocation, clinic capacity, and patient management.

One of the most alarming findings of this study is the high burden of concomitant STIs, with 50% of CA patients having at least one other diagnosed STI. Most critically, HIV was present in 37.7% of all CA patients. Syphilis (14.1%) and other non-syphilis STIs (36.6%) were also notably prevalent. The primary reason for STI co-infections is that these infections share common modes of transmission, primarily unprotected sexual contact. Individuals engaging in behaviors that put them at risk for one STI are simultaneously at risk for others. There can be biological interactions between different STIs that

facilitate acquisition or alter disease progression. For example, genital ulcerative diseases (like syphilis or herpes) can disrupt epithelial barriers, increasing the risk of HIV acquisition and transmission. The interplay between HIV and HPV is particularly synergistic and detrimental. HIV-induced immunosuppression (specifically the depletion of CD4+ T-lymphocytes) severely impairs the host's ability to control HPV infection. Multiple concurrent STIs can lead to a state of chronic immune activation and dysregulation, which might further impair the ability to control individual pathogens. Problem Behavior Theory suggests that various risk-taking behaviors (unprotected sex, substance use, multiple partners) often cluster together in individuals, stemming from a common underlying propensity for deviance from conventional norms or a sensation-seeking trait. In some instances, individuals who perceive themselves to be at lower risk for one outcome (pregnancy due to contraception) might engage in behaviors that increase their risk for other outcomes (STIs by not using condoms). This is less directly applicable here but speaks to the complexity of risk perception. This finding unequivocally supports the recommendation that all patients diagnosed with CA should be routinely and comprehensively screened for other STIs, with a particular emphasis on HIV and syphilis. Provider-initiated HIV testing and counseling (PITC) should be the standard in STI clinics.

The study revealed that a concerning 49.0% of CA patients reported not using protective measures (like condoms) during sexual intercourse, while only 36.3% reported using them. Individuals may not believe they are personally at risk of acquiring STIs or HPV ("it won't happen to me"). They may not view CA or other STIs as serious health threats. Barriers to condom use can be significant, including reduced sexual pleasure, embarrassment in purchasing or carrying condoms, difficulty in negotiation with a partner, cost, or lack of availability. They may doubt the effectiveness of condoms or not prioritize STI prevention. Insufficient reminders or prompts to use condoms. Negative attitudes towards condoms (viewing them as

unnatural or interfering with intimacy). If peers or partners do not support or expect condom use, an individual is less likely to use them. Lack of confidence in one's ability to obtain condoms, use them correctly, or negotiate their use with a partner. Social Cognitive Theory (SCT), emphasizes reciprocal determinism between behavior, personal factors (like self-efficacy), and environmental influences. Lack of skills, poor role models for safer sex, and environments where condoms are not readily accessible or normalized can all contribute to low usage. In some relationships, particularly affecting women or younger individuals, power imbalances can make it difficult to insist on condom use. Public health campaigns must vigorously promote consistent and correct condom use as a primary method for reducing STI risk. These campaigns should address and attempt to dismantle perceived barriers.

The finding that the CA patient cohort was predominantly heterosexual indicates that heterosexual transmission is the primary driver of CA in this specific hospital-based population. Patterns of partnership formation, societal norms regarding sexuality, and the epidemiology of STIs within the broader community influence this. While heterosexual transmission is common for many STIs globally, it's important to acknowledge that specific STIs can have different epidemiological patterns in different subgroups (higher rates of syphilis or lymphogranuloma venereum in MSM populations in some regions). Public health messaging and interventions for CA prevention should ensure they effectively reach and resonate with the heterosexual majority. While focusing on the predominant group, it is crucial that public health services remain inclusive and are equipped to address the specific sexual health needs of individuals of all sexual orientations. Even if not forming the majority in this particular CA cohort, minority sexual orientation groups often face unique health disparities and may have higher burdens of certain STIs globally. Culturally competent care is essential for all.

The significant involvement of adolescents and young adults, coupled with low protective measures, highlights critical gaps in knowledge and preventive practices. CSE programs must be implemented early, be scientifically accurate, evidence-based, and culturally sensitive. These programs should cover HPV transmission, the link between HPV and CA (and cancers), the full spectrum of STIs, the importance of consent, healthy relationships, and practical skills for negotiating safer sex and using condoms correctly. Public awareness campaigns utilizing diverse media channels should aim to normalize discussions about sexual health, reduce stigma, and provide clear information on where to access services. HPV vaccination is a cornerstone of primary prevention against CA (for vaccine-covered types like 6 and 11) and HPV-related cancers. Efforts must focus on achieving high and equitable vaccination coverage in early adolescents of both sexes, ideally before sexual debut. This requires addressing vaccine hesitancy through transparent communication about vaccine safety and efficacy, engaging parents and community leaders, and ensuring affordable and accessible vaccine delivery through school-based programs and routine healthcare services. Catch-up vaccination programs for older adolescents and young adults who missed earlier opportunities should also be considered and promoted. All patients presenting with CA must undergo routine and comprehensive screening for other STIs, with HIV and syphilis testing being non-negotiable components. Provider-initiated testing and counseling (PITC) for HIV should be standard practice. To effectively interrupt STI transmission chains, robust partner notification and management services are essential. Patients diagnosed with CA and other STIs should be supported and encouraged (through various confidential methods) to inform their sexual partners, who should then be offered counseling, testing, and treatment as appropriate. The detection of CA in children necessitates immediate and specialized attention. Healthcare systems must have clear protocols for the multidisciplinary assessment of such cases, always including a thorough evaluation to rule

out sexual abuse. This requires collaboration between pediatricians, dermatologists, child protection services, and law enforcement. Training for healthcare providers on recognizing and responding to potential child abuse indicators is critical. Public health interventions must be culturally sensitive and adapted to the specific social, economic, and cultural context of Denpasar, a major urban center and international tourist destination. This may involve engaging with community leaders, religious organizations, and tourism sector stakeholders.

This study benefits from providing recent (2021-2023) hospital-based data from a major tertiary referral center in Denpasar, offering valuable insights into the characteristics of patients seeking specialized care for CA. The inclusion of data on concomitant STIs is a significant strength. However, several limitations must be acknowledged. The retrospective design relies on the accuracy and completeness of existing medical records, which may be subject to documentation biases or missing information. As a single-center study, the findings may not be generalizable to the entire population of Denpasar, primary care settings, or other regions of Indonesia; it likely reflects a population with potentially more severe, recurrent, or complicated CA. The granularity of data for certain variables, such as a detailed breakdown of occupation or education levels, was limited in the source abstract, restricting deeper socioeconomic analysis. Furthermore, the study did not include HPV genotyping, which would provide insights into the specific viral types involved and the potential risk for associated malignancies. Causality cannot be inferred from a cross-sectional design; the study identifies associations and characteristics rather than direct causal links.

5. Conclusion

The prevalence of Condyloma Acuminata at Prof. Dr. I.G.N.G. Ngoerah General Hospital, Denpasar, between January 2021 and December 2023 was significant, at 40 per 1000 clinic visits. The condition predominantly affected adult males, often married,

heterosexual, with a history of high school education, and working as private employees. A concerning high proportion of patients reported not using protective measures during sexual intercourse. Furthermore, while half of the patients presented without other diagnosed STIs, the co-infection rate with HIV was alarmingly high (37.7% of the total sample), alongside notable rates of syphilis and other STIs. These findings paint a clear picture of the ongoing public health challenge posed by CA and associated STIs in this Denpasar-based hospital population. They urgently call for multifaceted public health strategies that are evidence-informed, targeted, and culturally sensitive. Key priorities include intensifying sexual health education (emphasizing safer sex practices and the benefits of HPV vaccination), expanding access to and uptake of HPV vaccination, promoting routine and integrated STI screening (especially for HIV and syphilis in all CA patients), ensuring effective linkage to comprehensive care and treatment, and strengthening partner management services. Further research, particularly prospective and behavioral studies, is essential to deepen the understanding of local transmission dynamics and to design and evaluate more effective, context-specific interventions to curb the spread of CA and improve sexual health outcomes in Bali.

6. References

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