

Concept Analysis Article

THE VULNERABILITY OF THE DIGITAL NATIVE GENERATION TO HIV/AIDS INFECTION: A CONCEPT ANALYSIS

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Abstract

Background: The digital native generation is the current generation of young people who are very familiar with the internet and gadget applications. This makes them vulnerable to the risk of disease transmission, both directly and indirectly.

Objectives: The study aimed to analyse the concept of the vulnerability of digital natives, or young adults, to HIV/AIDS.

Methods: This study used the 8-step concept analysis framework developed by Walker and Avant, along with a comprehensive literature review done across three databases: Google Scholar, ProQuest, and ScienceDirect. The literature reviewed included publications spanning the years 2004 to 2022.

Results: The concept identification findings derived from a comprehensive evaluation of 16 papers indicate that the defining features include individual characteristics, social factors, structural problems, and health programs.

Conclusion: The digital generation, characterized by their convenient access to the internet and digital media, has a greater vulnerability to HIV/AIDS transmission as a result of engaging in hazardous behaviours and participating in health initiatives. The use of digital media in intervention programs has the potential to decrease healthcare expenditures and improve the efficacy of HIV/STI control measures.

Keywords: *HIV/AIDS, Vulnerability, Young People*

INTRODUCTION

The HIV epidemic is expected to rise as individuals in high-risk populations spread the virus, affecting the general population through bridging groups. Scaling up awareness, prevention, and behavior change interventions can slow or halt the epidemic. In low and concentrated epidemics, reaching high-risk

populations with appropriate services can efficiently identify people living with HIV/AIDS, resulting in faster access to services, treatment, and support.

There are two terms used to categorize populations at risk of HIV/AIDS: key populations at high risk (IDUs, prisoners,

transgender people, male and female sex workers, and homosexuals) and vulnerable populations (adolescents, young adults, women, migrant groups, long-distance drivers, refugees). High risk individuals engage in activities associated with HIV transmission, while vulnerable populations are vulnerable to changes in living conditions that can increase their risk of contracting HIV (The Joint United Nations Programme on HIV/AIDS (UNAIDS), 2008).

Adolescents and young adults are vulnerable populations at risk of HIV infection, and they make up a growing proportion of people living with HIV worldwide. According to data in 2023, HIV prevalence in this age group accounts for nearly one-third (31%) of new HIV infections, with the highest rates occurring among those aged 20–24 years (World Health Organization, 2024). Strong peer relationships often influence common HIV risk behaviors such as sexual experimentation and drug abuse (Bonar et al., 2014).

The Indonesian Ministry of Health reports an estimated 543,100 people living with HIV/AIDS in 2022, with 10,525 new cases reported between January and March 2022. The highest risk factors for HIV transmission are risky sex in heterosexuals (28%), homosexuals (18%), and alternate needle use (4%). The age group of 25–49 years (67.9%) has the highest number of sufferers, followed by the age group of 15–24 years (20.8%). This number increased by 1% compared to 2021. According to the 2017 Indonesian Demographic and Health Survey revealed that 10% of male adolescents in Indonesia engage in premarital sexual behavior, with 86.9% engaging in sexual activities with girlfriends (Lukitosari, 2023). This poses a significant challenge for Indonesia in the current era of technological disruption.

Disruption means interruption of a process or activity that has been going on continuously (Terry, 2020). In the industrial era 4.0, disruption closely links to technological disruption, where new innovations lead to a more dominant technological performance (Fadilurrahman, Kurniawan, Ramadhani,

Misnasanti, & Shaddiq, 2021; Mahayanti & Ismoyo, 2021). There are five technologies that are the main pillars in the development of technological disruption, namely the Internet of Things (IoT), big data, artificial intelligence (AI), cloud computing, and additive manufacturing. Technological changes and developments in the current disruption era have made it easier to use electronic communication technologies such as the internet (Baiyere & Hukal, 2020). Indonesia's internet users reached 210 million in 2021–2022, a 6.78% increase from the previous year. The age group 13–18 years had the highest internet penetration rate at 99.16%, followed by 19–34 years at 98.64%. Social media usage reached 191 million in 2022, with WhatsApp being the most popular app at 88.7%, followed by Instagram at 84.8% and Facebook at 81.3%. Some users were teenagers and young adults.

The young adult age group includes the digital native generation, which is a generation born in the digital era and uses more software technology such as computers, gadgets, and several other devices produced in the digital era (Dingli & Seychell, 2015). In general, there are three main motivations for adolescents to access the internet, namely helping to find and send information, for entertainment, and to connect with old friends through social media (Hidayat, Saefuddin, & Sumartono, 2017; Pramiyanti, Putri, & Nureni, 2014). Easy internet access, pornographic content, social media, and chat applications can all increase the sexual risk of contracting HIV/AIDS in this generation. Therefore, this article will discuss, through a concept analysis, how vulnerable the digital native generation is to contracting HIV/AIDS. This concept analysis can also provide an overview of the implications of community nurses' involvement in HIV/AIDS prevention efforts for the digital native generation.

MATERIALS AND METHODS

This concept analysis aims to clarify the meaning of the concept of 'vulnerability' in order to increase awareness among the digital

native generation not to contract HIV/AIDS. We conducted a systematic literature review to identify the concepts that emerged from the literature search. The keywords used during the literature search process were: (digital native generation) AND (vulnerability to HIV/AIDS infection). The method of concept analysis applied follows the eight-step process outlined by Walker and Avant (2019). These steps include: (1) selecting a concept; (2) determining the purpose of the analysis; (3) identifying all instances of concept usage; (4) determining the defining characteristics of the concept; (5) modelling cases; (6) making borderline and contrary cases; (7) identifying the antecedences and consequences; and (8) defining the empirical referents. Data extraction was accomplished utilizing a standardized data collecting tool (see Figure 1).

RESULTS AND DISCUSSION

This concept analysis approach is used to provide the ability to classify, formulate, label, discuss, and influence phenomena of interest in a particular discipline. According to (Rodgers, Jacelon, & Knafl, 2018), concept analysis is the first step in helping researchers use study findings in several ways to help scientific and research efforts be carried out. The following are the results of concept identification and definition using Walker & Avant's steps:

Identify or select a concept

The concept discussed in this article is the digital native generation's vulnerability to contracting HIV/AIDS in the context of community nursing. The digital native generation encompasses generation Y (millennials), born between 1981 and 1995, and generation Z, born between 1996 and 2010, who, since learning to write, read, move, and interact, have been familiar with and utilized internet technology, including gadgets and social media. Each generation's technological development actually makes it easier for individuals to run their lives effectively and efficiently. However, this development is like a double-edged sword,

requiring special attention from all stakeholders. Despite the numerous advantages of internet use, the digital native generation is deeply concerned about its potential drawbacks, including the increased risk of HIV/AIDS sexually transmitted diseases due to risky behavior on the internet and social media.

Determining the purpose of concept analysis

This step aligns with the objectives of the concept analysis, focusing on the digital native generation of men and women aged 18–30 years (young adult age group) who are actively promoting HIV/AIDS prevention while taking into account the attributes, characteristics, and specificities that contribute to their vulnerability to HIV/AIDS. This will allow the researcher to understand the concept of vulnerability to HIV/AIDS in the digital native generation and encourage further research that takes into account the various aspects of vulnerability.

Identifying all uses of the concepts found

The following are the definitions of the concepts found based on some literature from the databases used (Table 1).

Determining definition attribute

Based on concept identification results from 15 reviewed articles (Table 2), the definition attributes are: individual characteristics, social aspects, structural factors, and health programs.

Individual characteristic

Individuals are cognitive beings that encompass biological, emotional, cognitive, and attitudinal aspects related to social relationships. These aspects are defined as the quantity and quality of information available to individuals in relation to their processing capacity. Biological development accompanies the transition from adolescence to young adulthood. The increased hormone secretion by the pituitary gland activity in the brain has far-reaching physiological effects. Young adults' biological changes influence the social and psychological changes that occur during the transition to adulthood.

Growth hormones influence the rapid growth spurt, resulting in the body gaining height and weight in about two years. The physical changes that occur during this time also influence the emergence of sex drives (Santrock, 2019). Thus, young adults have an incentive to engage in free sexual behavior that makes them vulnerable to HIV/AIDS transmission.

Social aspects

Vulnerability is defined as the cultural, social, and economic aspects that determine people's opportunities to access goods and services. The uncondusive social environment of young adults, such as the lack of strict norms and the strong influence of peers, puts adolescents at risk for behaviors that violate society's norms, such as free sex and drug use. The rapid advancements in information technology, including easy access to social media and the internet, have a significant impact today. Thus, the digital generation, especially the young adult group, becomes increasingly vulnerable when not utilizing these changes in information technology properly.

Structural factors

It is an event that occurs in a person's life that causes the risk of health problems; for example, moving residence, the presence of new family members, or family members leaving home can affect communication patterns (Stanhope & Lancaster, 2016). Events in life can increase the risk of health issues; for instance, less harmonious family relationships, ineffective parental communication during adolescence, and the growth and development of reproductive health experienced in the past can influence young adults' sexual behavior.

Health programs

This term refers to the social resources needed to protect individuals from risks to their physical, psychological, and social integrity and well-being. HIV/AIDS disease prevention is understood as a specific intervention based on healthy and at-risk individuals or populations in the form of primary and secondary prevention

efforts (early detection). The majority of community health nursing practices aim to stop the progression of the disease as soon as symptoms appear, employing suitable levels of prevention (Nies & McEwen, 2015). Both prevention and treatment aim to reduce disease burden and associated risk factors.

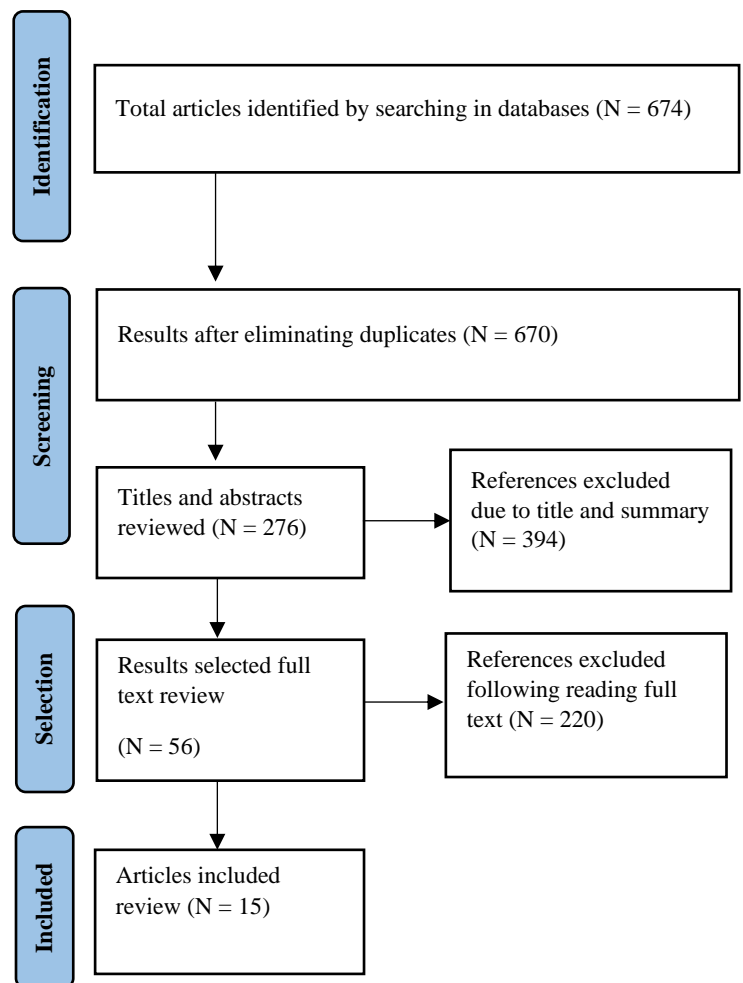


Figure 1. PRISMA Figure. Results of The Systematic Literature Review

Table 1. Results of concept/definition identification vulnerability

No	Sources	Field of study	Definition
1	(Mabala, 2008)	Social	Vulnerability refers to the risk of being harmed, such as being at a high risk of contracting HIV/AIDS due to unprotected sexual intercourse or unclean injecting equipment, and thus directly exposed to the virus.
2	(UNAIDS, 2008)	Health	Vulnerability refers to the circumstances and conditions that make the risk-behaviors more likely to contract HIV/AIDS. Young adults are vulnerable to HIV/AIDS because they belong to key populations such as sex workers, homosexuals, injecting drug users, or transgender people. In addition to key populations, vulnerability also occurs when adolescents face discrimination, stigma, and violence, as well as an imbalance of power in relationships and the impact of alienation from the family.
3	(UNICEF, 2016)	Social	Vulnerability is the extent to which an individual is likely to experience risk due to exposure to individual, family, community, and structural characteristics. Vulnerability can be thought of as a transactional relationship between the context in which an adolescent girl lives and the factors that put her 'at risk' of, for example, contracting HIV/AIDS.
4	(World Health Organization, 2013)	Health	Three sets of variables and their interactions influence vulnerability to HIV/AIDS: (i) factors such as group or subculture membership; (ii) the quality and coverage of program services; and (iii) broader social and environmental influences.
5	(Gupta, Parkhurst, Ogden, Aggleton, & Mahal, 2008)	Health	Many of the conditions of vulnerability are beyond a young person's individual control, and they are often referred to as structural or environmental factors of risk.
6	(Idele et al., 2014)	Health	Having unprotected sex is the most important route to HIV infection for adolescents, and the second is sharing infected needles. Vulnerability is also caused by a lack of knowledge about HIV and how to prevent it.
7	(Jewkes, Dunkle, Nduna, & Shai, 2010; Santelli et al., 2013)	Health	Adolescent girls are more vulnerable to HIV infection when engaging in transactional sex, having multiple partners, engaging in substance abuse, and using infrequent condoms.
8	(Birdthistle et al., 2008)	Health	Structural factors, such as parental loss and school dropout, are associated with vulnerability to HIV transmission.
9	(Osborne et al., 2021)	Social	Vulnerability is the failure of individuals or groups of individuals to recover from exogenous shocks stemming from the interaction of causal forces and processes operating at local, national, and global scales. Vulnerability also resides in complex relationships between political economy, kinship systems, social traditions, and cultural politics.
10	(Southall, DeYoung, & Harris, 2017)	Health	Vulnerability is the confluence of biological, social, political, economic, and other emerging factors that put individuals and communities at greater risk of disease.
11	(Diderichsen, Hallqvist, & Whitehead, 2019)	Health	Vulnerability does not stem from individual characteristics, but rather from social processes that can lead to increased exposure to different types of risks, increased susceptibility to adverse impacts, and a reduced ability to respond through coping or adaptation.

12	(Queiroz, Sousa, Brignol, Araújo, & Reis, 2019)	Health	In the context of the HIV/AIDS epidemic, vulnerability refers to the concept that a variety of individual, collective, and contextual factors, when combined, increase a person's susceptibility to infection and disease.
13	(Nkosi et al., 2022)	Health	Vulnerability is defined as a person's feeling that they are more vulnerable to harm, exploitation by others, risk of any kind (health, social, psychological), or a third person's description of the same range of feelings.
14	(Arora, Shah, Chaturvedi, & Gupta, 2015)	Health	Vulnerability is a condition of weakness or helplessness. The concept of vulnerability generally refers to groups of people who are more exposed to risk than others. Vulnerability is a relative state, with levels and types varying over time and between countries, and is highly contextualized.
15	(Wadhwa, Ghosh, & Kalipeni, 2012)	Social	Vulnerability is powerlessness, insecurity, and exposure to risks, shocks, and stress.

Table 2. Attribute Definition

Keyword	Sources	Attribute Definition
<ul style="list-style-type: none"> • Unprotected sexual intercourse • Drug use with shared or unclean injection equipment • Being a sex worker • Homosexuality • Transgender • Lacking the necessary knowledge about HIV/AIDS • Having multiple sex partners • Weakness or helplessness or powerlessness • Shocks and stress • Feeling more vulnerable to harm • Insecurity 	(Idele et al., 2014; Jewkes et al., 2010; Mabala, 2008; Queiroz et al., 2019; Santelli et al., 2013; Wadhwa et al., 2012)	Individual characteristics
<ul style="list-style-type: none"> • Dealing with stigma and discrimination • Social process • Violence • Transactional sex • Factors that put 'at risk' • Broader social and environmental influences • Complex relationships between political economy, kinship systems, social traditions, and cultural politics 	(Arora et al., 2015; Diderichsen et al., 2019; Nkosi et al., 2022; Southall et al., 2017)	Social aspects

• Reduce ability to respond through adaptation		
• Exploitation by others		
• Circumstances whose relative extent and type vary over time and between countries		
• The impact of power imbalances in relationships and the alienation from family	(Birdthistle et al., 2008; Gupta et al., 2008; Arora et al., 2015; (World Health Organization, 2013)	Structural factors
• Group or subculture membership factors		
• Loss of parents		
• Dropping out of school		
• Groups of people more exposed to risk		
• Quality and coverage of program services	(Diderichsen et al., 2019; Nkosi et al., 2022)	Health program
• Risk of any kind (health, social, psychological)		
• Lack of response		

Making borderline and contrary cases

Borderline case

"Bro. A (22 years old) is studying at a university in his city. Mr. A lives in a boarding house with his friends who study in the same place. According to his confession, he is a same-sex lover and usually looks for partners through dating or chatting applications. When Bro. A met his same-sex partner, he had anal sex. While doing so, Bro. A always uses condoms because he frequently seeks information and consultation on how to prevent infectious diseases like HIV/AIDS. When hanging out with his friends, Bro. A also frequently watches pornographic movies on the internet. Additionally, Bro. A and his friends have undergone examinations to determine their health conditions.

Contrary case

"Ms. X (21 years old) is a young adult who lives with her parents and family. She is currently a final-year student and remains active in her campus organization. Ms. X lives in a supportive and caring community. Currently, Ms. X has a boyfriend who will get married after graduation and is already known to her parents. The two of them have been dating since college, and during that time, their dating style is different from that of young people, some of whom have had sex outside of marriage. Her boyfriend also never used needle drugs or had sex with other people, such as commercial sex workers. Ms. X uses gadgets and the internet to complete her campus assignments and for entertainment purposes, including listening to music, watching movies, and making video calls with her friends and college community. In addition, Ms. X frequently searches for and obtains information about things going viral on social media, one of which is HIV/AIDS. Thus, Ms. X and her boyfriend know the consequences of behaviors at risk of contracting the disease based on the information they seek and obtain."

Identifying the antecedences and consequences

According to Walker and Avant (2019), an antecedent is an event that occurs before the

concept. This article focuses on the vulnerability of the digital native generation (young adults) to HIV/AIDS. The following antecedents have been identified in this concept, namely: knowledge of HIV/AIDS prevention (Shamu et al., 2020; Shokoohi et al., 2016; Yang, Li, Subramanian, & Lu, 2021), the role of parents (Adenike, 2013), family members (Thurman, Nice, Lockett, & Visser, 2018), and the community and school environment (Namisi et al., 2009) in supervising young people, negative influences from the environment related to socializing, changing social and structural factors (Mabaso et al., 2018; Miller et al., 2018; Naidoo, Chirinda, Mchunu, Swartz, & Anderson, 2015) and young people with high risk behaviors for HIV/AIDS (Kteily-Hawa et al., 2022; Patrick, O'Malley, Johnston, Terry-McElrath, & Schulenberg, 2012; Pei et al., 2018).

Defining the empirical referents

Empirical referents are classes or categories of actual phenomena that, by virtue of their existence or presence, indicate the concept's occurrence. The purpose of these instruments is to assess attributes, not to quantify concepts. Here are some instruments that can be used to attribute individual vulnerability, social vulnerability, structural factors, and health programs. Vulnerability to HIV/AIDS among youth can be measured through knowledge of how HIV/AIDS is transmitted and its preventive measures (Fernández, Cardona, Arango, & Velasquez, 2017; Saad, Subramaniam, & Tan, 2013). Arije et al., (2021) developed twelve vulnerability factors, including information on the respondents' background characteristics, knowledge and use of male and female condoms, sexual history, sexually transmitted infections (STIs), treatment-seeking behavior, knowledge, opinions, and attitudes about HIV and AIDS, incest, rape, pregnancy, and self-esteem. The score for each of the 12 factors for each respondent was summed to derive their vulnerability score. Social vulnerability refers to the negative health effects that external stresses can have on communities.

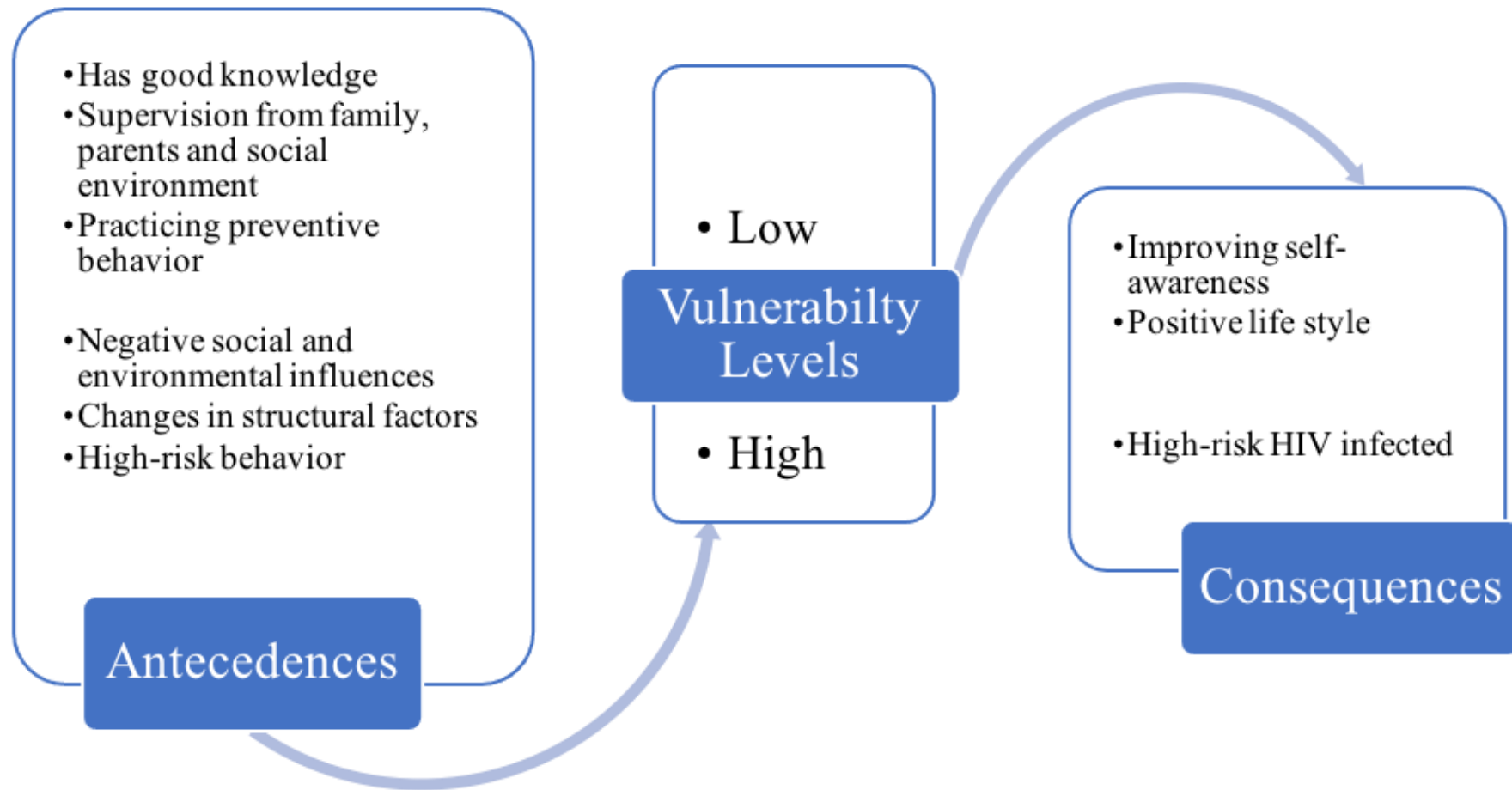


Figure 2. Identifying the Antecedences and Consequences

The score for each of the 12 factors for each respondent was summed to derive their vulnerability score. Social vulnerability refers to the negative health effects that external stresses can have on communities. Dailey et al., (2022) used the Social Vulnerability Index (SVI) to assess social aspects. In the study by Saad, Subramaniam and Tan, (2013), they also used the socio-economic factors and behavior/lifestyle that may put them in the high-risk group of HIV/AIDS to assess social aspects of vulnerability.

The term "HIV-related structural factors" refers to several elements within the environment that may either hinder or support an individual's engagement in HIV prevention behavior. These variables include economic, social, policy, organizational, and other dimensions (Sumartojo, 2000). Aral, Lipshutz and Blanchard, (2007) argue that structural factors, such as economic disparities, laws, regulations, and systematic discrimination, exhibit more predictive power in determining the incidence of HIV and STI transmission at the population level. Marshall et al., (2011) used the structural factors questionnaire to get information about people's sexual activity, use of illegal drugs (both injectable and non-injectable), behaviors that are linked to an increased risk of HIV, experiences with addiction treatment, interactions with police and security staff, and use of healthcare services.

The health program should develop some activities to protect individuals with HIV/AIDS from risks to their physical, psychological, and social integrity and well-being. Nyblade et al., (2013) conducted research that evaluated the use of health facility policies and work environment evaluation in relation to HIV, specifically within the context of health programs. This questionnaire comprises seven questions aimed at evaluating the accessibility of protective supplies, such as gloves and post-exposure prophylaxis, as well as the provision of training, specifically on confidentiality. Additionally, it seeks to assess the presence and execution of policies designed

to safeguard people living with HIV (PLHIV) and evaluate the level of support within the facility environment for staff members who are living with HIV.

CONCLUSIONS

The concept analysis above indicates that risky behavior due to individual, social, structural, and health programs puts the digital generation at risk of contracting HIV/AIDS. This generation's straightforward access to the internet and digital media also increases the risk of vulnerability. Therefore, community nurses need intervention programs that utilize digital media to reach this generation, enabling them to easily receive messages about HIV/AIDS prevention. Digital advancements like the internet and mobile phones present a promising avenue for cost reduction within healthcare systems already burdened by high service delivery expenses. This approach has the potential to enhance the effectiveness of HIV/STI control programs.

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DECLARATION OF CONFLICTING INTEREST

There are no potential conflicts of interest.

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AUTHOR CONTRIBUTION

Moh. Khotibul Umam: Contributed making substantial contribution (concept and methodology), drafting and revising the manuscript.

Agus Setiawan: Contributed making data extraction and giving final approval of the version to be published, agreeing to be accountable for all aspects of the work.

Henny Permatasari: Contributed making data extraction and giving final approval of the version to be published, agreeing to be accountable for all aspects of the work.

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