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STAGES OF BEHAVIORAL CHANGE IN HIV/AIDS PREVENTION AMONG ONLINE SEX WORKERS

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Abstract
Online sex workers connect with clients through digital platforms such as social media and messaging applications, yet sexual encounters still occur in person, placing them at high risk for HIV/AIDS transmission. This descriptive qualitative study explores the stages of behavioral change in HIV/AIDS prevention among online sex workers in Semarang City using the Transtheoretical Model (TTM), which includes stages of change, self-efficacy, and decisional balance. Four main informants were purposively selected and interviewed in depth. Data were analyzed thematically and deductively based on the TTM framework. The findings show that all informants had reached the contemplation stage, with progression varying across preparation, action, and maintenance stages. However, behavioral implementation in the action stage remained limited, especially when condom negotiation was challenged by client pressure. In terms of VCT utilization, most informants stayed at the contemplation stage, with relatively low self-efficacy. Conversely, self-efficacy related to condom use was higher among informants who could assert boundaries with clients. Regarding decisional balance, informants experienced a dilemma between self-protection and economic needs. Although they acknowledged the benefits of VCT, this awareness had not yet led to consistent preventive actions. These findings underscore the need for interventions tailored to behavioral readiness, enhanced self-efficacy, and strengthened social and economic support to sustain effective HIV/AIDS prevention behaviors among online sex workers.
Keywords: Online sex worker, Prevention, HIV/AIDS, Transtheoretical

Introduction

The Human Immunodeficiency Virus (HIV) remains one of the most pressing global public health issues, with 39.9 million people living with HIV worldwide in 2023.[(1)(2)] Indonesia, as a developing country, also faces a high burden of HIV, with 503,261 reported cases as of June 2023.[(3)] In Central Java Province alone, it is estimated that there are 52,677 individuals living with HIV/AIDS in 2023.[(4)] Sex Workers are one of the key populations with a high vulnerability to HIV transmission, with an HIV prevalence of 3.0%.[(5)] This vulnerability is exacerbated by structural and personal factors, such as economic difficulties, low health literacy, and strong social stigma, which not only drive women into sex work but also limit their ability to engage in prevention.[(6)(7)]

Online sex workers (OSW) are individuals who offer or sell sexual services through digital platforms, engaging with clients either partially or entirely online.[(8)] One subgroup of OSW, known as female online sex workers, is the focus of this study. The closure of prostitution areas in Indonesia including the Sunan Kuning district in Semarang in 2019 shifted sex work from organized, regulated settings to the less supervised digital platform.[(9)(10)] This transition brought new challenges, such as limited access to healthcare services and lower reach of HIV education and testing. At the same time, it offered certain advantages, including greater flexibility in choosing clients, freedom in setting prices,

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and the ability to maintain anonymity. However, while these benefits enhance economic and social independence, they also create barriers to HIV prevention. Many female online sex workers tend to prioritize client satisfaction over consistent condom use, and the anonymous nature of their work makes it more difficult for health promotion programs to reach them.

This situation emphasizes the urgency of research on HIV prevention behavior readiness among online sex workers, considering that conventional prevention strategies previously implemented in localized settings are no longer fully effective in reaching this group. The Transtheoretical Model (TTM) offers a relevant framework as it is able to map the stages of behavioral change: pre-contemplation, contemplation, preparation, action, and maintenance, and allows interventions to be tailored according to individual behavioral readiness.[11] [12]
However, studies using the TTM approach in the context of HIV prevention for online sex workers, especially in Indonesia, are still very limited.

Based on this background, this research aims to explore the stages of behavior change in HIV/AIDS prevention, both through the use of condoms and Voluntary Counseling and Testing (VCT), among online sex workers in Semarang City using a TTM approach. The findings from this research are expected to serve as a foundation for the development of more adaptive, stage-based HIV prevention interventions that can reach key vulnerable populations with unique dynamics in their practices.

Method

This study used a descriptive qualitative approach to gain a deeper understanding of how female online sex workers in Semarang City engage in HIV/AIDS prevention behaviors within the TTM framework. Four women were purposively selected as informants based on the following criteria: actively working as online sex workers for one to ten years and residing in Semarang.

Primary data were collected through in-depth, semi-structured interviews guided by questions aligned with key TTM components, including the stages of change, self-efficacy, and decisional balance. Each interview lasted approximately 45–60 minutes, was conducted in a private setting to ensure comfort, and audio-recorded with the participants' consent. All recordings were transcribed verbatim to maintain the authenticity of the informants' narratives.

Data were analyzed thematically using a deductive approach based on the TTM framework. This approach allowed the analysis to stay focused on the theoretical model while remaining open to new insights that emerged from the field. Credibility of the findings was strengthened through source and method triangulation by comparing the interview results with observations made during data collection.

Participation in the study was entirely voluntary, and confidentiality was maintained throughout the research process. Ethical approval for this study was granted by the Health Research Ethics Committee of the Faculty of Public Health, Universitas Muhammadiyah Semarang (No: 0027/KEPK-FKM/UNIMUS/2025).

Results

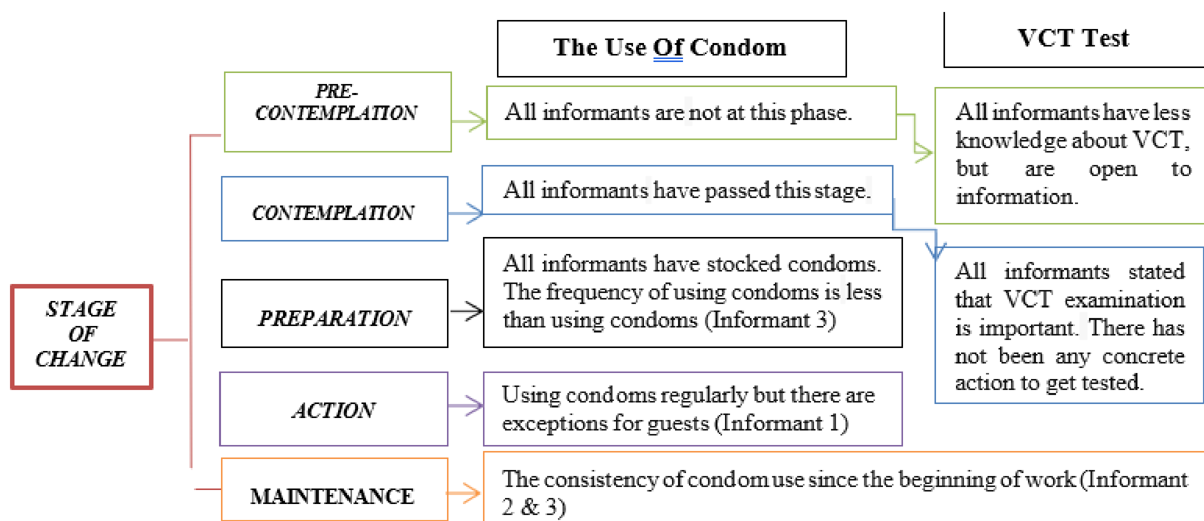
The main informants in this study consisted of four individuals who work as online sex workers. They were selected based on their willingness to participate in in-depth interviews about the HIV prevention behaviors they practice in their work. The key characteristics of these primary informants in this study are based on the following:

Table 1 Main Informant Characteristics

No	Initial Informant	Age (Years)	Online Application	Latest Educational History	Working Duration (Years)	Marital Status	Job Status
1.	Informant 1	25	Mi-Chat	Junior High School	3	Divorced by Death	Main Job
2.	Informant 2	24	Mi-Chat	Junior High School	5	Divorced by Life	Main Job
3.	Informant 3	29	Mi-Chat	Senior High School	2	Divorced by Life	Main Job
4.	Informant 4	27	Mi-Chat	Senior High School	1	Divorced by Life	Main Job

The research findings indicate that the informants entered online sex work due to economic difficulties, family dynamics, and limited education, especially after losing a partner. MiChat served as their main platform for finding clients, with income based on client volume usually 3–6 clients per day at rates of IDR 250,000–IDR 400,000. The clients they served were very diverse, ranging from informal workers to professionals. Meetings usually took place in rented boarding rooms, which were considered safer and more flexible. Common challenges included refusal to use condoms, sudden cancellations, and uncertainty in the number of clients, leading some informants to feel the need to adjust their strategies to continue meeting their living expenses.

Stages of Change



Picture. 1. Stage of Change

Pre-contemplation

Interview findings revealed that all informants possessed a basic understanding of HIV/AIDS, recognizing it as a serious infectious disease. Their awareness primarily related to transmission risks, frequent partner changes, and condom use. This shared perception is illustrated in the following statement:

I2: *"It's a deadly virus because it can be transmitted, right, Ma'am? Both men and women have the same risk, especially if they often change partners. HIV can spread through sexual fluids. To prevent it, you have to use protection. Another way is by taking PrEP regularly I just recently learned about that, but I've never tried it myself."*

Despite their general awareness of HIV, several informants demonstrated limited knowledge regarding HIV testing services, particularly related to pre-test and post-test counseling procedures within VCT services.

I1: *"I don't really know what VCT is. I only know about the HIV test — the one that uses blood."*

Most informants reported learning about HIV through informal channels—friends, neighbors, clients, or online searches—rather than structured health education or outreach programs.

I2: *"I heard about HIV from my neighbor behind my boarding house. She once had it and told me it's dangerous and contagious, and that I should always use condoms. I got curious, so I started looking it up on Google."*

In one case, information obtained from a client who was a medical professional led to a false sense of safety, resulting in unprotected sexual activity.

I1: *"Yes, from a doctor, Ma'am. One of my clients was a doctor. When we were together, we didn't use a condom because he checked my vagina first and said, 'Oh, you're clean. I'm fine without a condom."*

Contemplation

The analysis revealed that all informants recognized the importance of consistent condom use to prevent sexually transmitted infections and unintended pregnancies. This awareness was generally shaped by past personal experiences and health-related considerations.

I1: *"Yes, using condoms is a must. I've learned my lesson after getting an infection before… When I got sick, I had to go for checkups twice a week. Now that I'm healed, I still try to go once every week or two."*

I2: *"Of course, Ma'am. I have to use condoms to prevent pregnancy, and also to avoid diseases. It's something I just have to do."*

Although condom use was understood as an essential preventive measure, most informants were not yet ready to undergo HIV testing. Their hesitation reflected emotional and psychological barriers rather than lack of knowledge about HIV transmission.

The primary factors contributing to testing avoidance included fear of receiving a positive result, anxiety, and the belief that being asymptomatic indicated they were not infected.

I4: *"It's important and necessary HIV is a terrible disease. If we have sex and end up infected, I'd feel bad if my client got it too. That's why we have to take care of ourselves first. I've never taken the test, though, because I'm scared of the result. I'm afraid it'll just stress me out. If there's an offer to get tested, I might consider it but for now, I'm not ready."*

Preparation

All informants expressed intentions to use condoms more consistently and reported that they routinely prepare their own supply. Condom purchasing was described as a personal responsibility supported by peers who encouraged safer sexual practices.

I4: *"Yes, I plan to, and it's a must. Only my friends know about my job, and they encourage me to always use condoms. I usually buy Sutra brand condoms one pack lasts about four days. I often get them from Indomaret."*

Despite these intentions, condom negotiation remains a significant barrier, particularly when clients refuse to use protection. Some informants noted that condom use often depends on the client's preference rather than their own decision-making power.

I4: *"I do plan to use condoms more regularly, miss, but it depends on the client. It usually has to come from them first. I've never really had support from friends about it. I buy condoms at Alfa, usually three packs of 12 pieces each, and they last about two weeks. I use Sutra now because once a Durex one tore. Honestly, I often don't use condoms last month I didn't use them about six times. It still depends on what the client wants. I usually ask first, 'Do you want to use one or not?' If they say yes, we use it; if not, we don't most say it's uncomfortable. The last time I used one was about two weeks ago."*

Action

Most informants reported that they had begun using condoms regularly during sexual activities and ensured they maintained a personal supply. Condom use was described as a negotiated practice that sometimes required persistence when faced with initial client resistance.

I3: *"I always use them, miss I even keep my own stock. The last time I used a condom was last Sunday. Some clients refuse at first, but in the end, they agree. Some complain, but I just stay firm if they want to, fine; if not, that's their choice."*

Despite this routine condom use, some informants acknowledged selectively foregoing condoms with certain clients, particularly those perceived as trustworthy or professionally reputable, such as doctors or law enforcement officers. This perception of lower risk influenced their decision-making during sexual encounters.

I1: *"For the past three years, I've been using condoms regularly. I used to skip them before I got an infection. But, miss, if the client is an officer or a doctor, sometimes I still take it off and put it back on. When it's with officers, I get scared it could become a big problem if things go wrong."*

Maintenance

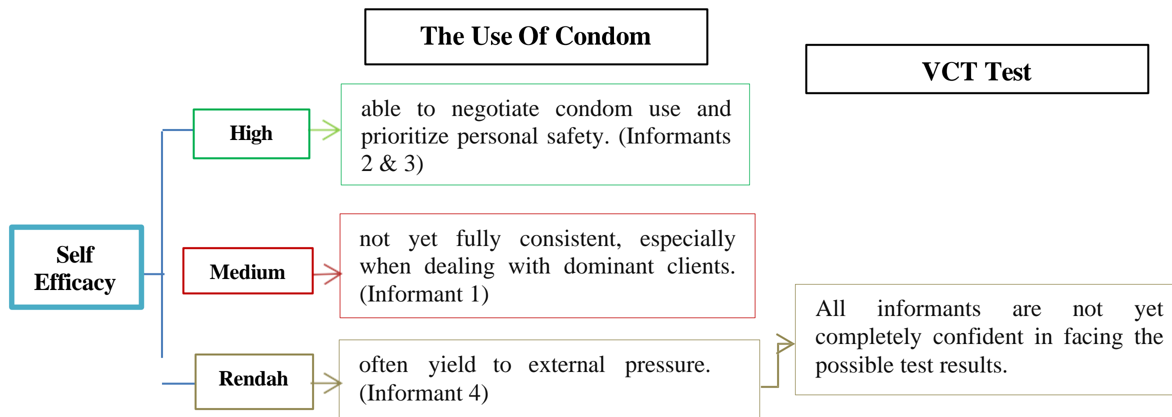
Several informants reported that they had consistently maintained HIV prevention behaviors since they first began working as online sex workers. Condom use was described as a routine, non-negotiable practice supported by personal readiness and self-prepared supplies.

I3: *"I always use condoms, miss I even keep my own supply. The last time I used one was last Sunday. Some clients refuse at first, but in the end, they agree. Some complain, but I stay firm if they want to, fine; if not, that's up to them. I've been using condoms consistently since I first started working…"*

Informants also emphasized a strong personal commitment to continue using condoms, even when clients offered higher payment for unprotected sex. Their decisions were driven by concerns for health, personal safety, and family responsibilities.

I2: *"Even if someone offers me a lot of money, I'll say no, miss. I've already made up my mind to always use condoms. If they ask me to take it off, I won't. I have a child to think about, and honestly, it's also about health it can hurt if I don't. Some clients aren't clean, so I have to protect myself."*

Self-Self-Efficacy



Picture. 2. Self Efficacy

Variation in Self-Efficacy

Findings showed varying levels of self-efficacy in HIV prevention, ranging from high to moderate and low. Informants with high self-efficacy demonstrated strong confidence and consistent condom use, driven by responsibility toward family.

I2: *"I always use condoms, 100%... I have a child, so I need to stay healthy."*

I3: *"What keeps me determined to stay healthy is my child... I don't want my child to suffer."*

Informants with moderate self-efficacy generally intended to use condoms but sometimes complied with client requests especially those perceived to hold higher social status.

I1: *"Maybe around 90%, miss... but if the client's a real doctor or an officer, sometimes I feel okay not using it."*

Those with low self-efficacy reported difficulty refusing clients and maintaining consistency, often influenced by financial needs.

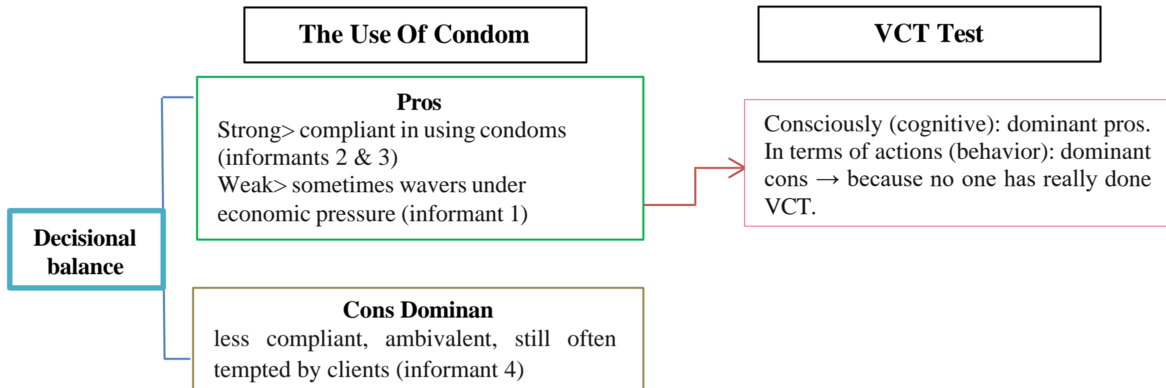
I4: *"Maybe around 80%... The other 20% depends on the client... It's hard to earn money, you know, miss."*

Low Self-Efficacy Toward HIV Testing

Across all informants, self-efficacy related to HIV testing remained low. Despite recognizing its importance, emotional readiness, fear of results, and anxiety hindered testing intentions.

I3: *"I've never taken the test, miss. I'm scared of what the result might be... I'm just not ready."*

Decisional Balance



Picture. 3 Decisional Balance

All informants stated that they used condoms primarily to protect their health and prevent unintended pregnancy. Past experiences with sexually transmitted infections also strengthened their caution.

I4: *"So I won't get pregnant, and to stay safe from diseases…"*

I1: *"…Because I once got an infection, now I try my best to always use one."*

Despite this awareness, maintaining consistent preventive behavior was not always easy. Client pressure, financial concerns, and discomfort during use often created dilemmas.

I4: *"Sometimes clients complain… or offer more money not to use one. Situations like that can really shake your resolve, but I try to remind myself of the risks."*

All informants acknowledged the importance of VCT for early detection and prevention. However, none had undergone testing, mainly due to fear, anxiety, and emotional unpreparedness.

I3: *"I've never done the test, miss. I'm scared what if the result's bad? I'm just not ready to know."*

Discussion

Stages of Behavioral Change in the Prevention of HIV/AIDS

All informants in this study have passed the contemplation stage in the TTM, which indicates that they have a basic awareness of the risks of HIV/AIDS and the importance of preventive behaviors. A small portion of informants has been at the preparation and action stages, while half of the remaining informants have reached the maintenance stage in consistently implementing HIV preventive behaviors. There are no informants at the precontemplation stage, which is suspected to be because all informants have sufficient knowledge about HIV/AIDS and the importance of condom use as a self-protection effort.(13) This fairly good knowledge is largely obtained through informal sources such as friends who are also sex workers, independent searches via Google, or guests who are professionals like doctors. This shows that information obtained indirectly through social interaction and digital access has contributed to the initial awareness of risks, although this approach differs from formal education which is usually conducted through lecture methods or outreach using media such as pamphlets. Although the approaches differ, both informal and formal education play an important role in raising awareness at the contemplation stage, which is the phase when individuals begin to consider behavior change.(14)

Good knowledge influences real actions in using condoms. Therefore, increasing knowledge

remains an important element in encouraging HIV prevention actions.[15] On the other hand, all informants also demonstrated a good understanding of the importance of VCT testing as an early detection step for possible infections.[16] This awareness arises from the understanding that jobs involving sexual relations with multiple clients carry a high risk of transmission. However, in practice, not all informants have taken consistent real actions in undergoing regular VCT examinations. Psychological barriers such as fear of test results and anxiety about health status are the main obstacles to taking action.[17] Self-efficacy and social support are important factors in driving behavioral change, but both are still hindered by emotional barriers that have not yet been fully addressed.[18]

In the preparation stage, the informants begin to take concrete steps, such as buying condoms independently and expressing their intention to be more consistent in prevention. However, the transition to the action stage is often hampered by pressure from clients, economic dependency, and fear of rejection.[7][19] External barriers such as client demands that reject the use of condoms and concerns about losing income remain major challenges in maintaining consistency in preventive behavior. Financial dependency places female sex worker in a weak bargaining position, so even if they intend to protect themselves, they often have to compromise to maintain work relationships and income. In this context, the dynamics of decision-making are influenced not only by individual awareness, but also by complex relational and economic factors, including emotional attachments and specific social conditions that weaken control over safe behavior.[20] This situation highlights the need for structural interventions that not only provide access to prevention tools but also strengthen the economic resilience and negotiation position of female sex worker in interactions with clients.[21]

The action phase is characterized by the regular use of condoms, although it is not yet fully consistent. An informant, for instance, is still willing to not use condoms with certain clients deemed "safe", such as doctors or officials (informant 1). This reflects a bias in risk assessment, which is also often encountered. Subjective perceptions frequently prevail over rational considerations of risk.[21] This is consistent with previous research findings that show that although individuals are in the action stage, they still face challenges in believing in the importance of condom use, especially when the decision involves cooperation and approval from partners or clients.[22]

At the maintenance stage, some of the informants showed a strong consistency in maintaining preventive behaviors. They firmly rejected condomless sexual relations, even when offered higher payments (informants 2 & 3). This attitude demonstrates the internalization of health values and self-protection, as well as reflecting high self-efficacy and intrinsic motivation.[23] However, there are still external challenges such as stigma, as well as limited access to information and services that can act as hindering factors like client pressure, large payment offers, or discomfort when using condoms. Nevertheless, an increase in negotiation skills and assertive rejection shows a positive direction of change.[23][24][25]

Self-Efficacy in HIV prevention efforts

The research results show that the level of self-efficacy of the informants in HIV prevention behaviors varies and is related to three dimensions of self-efficacy according to Bandura, namely magnitude, strength, and generality.[26][27] Informants with high self-efficacy (informants 2 & 3) show strong magnitude (willing to reject clients who refuse condoms), high strength (consistent confidence despite the risk of losing income), and broad generality (consistent across various situations, both with old and new clients). These findings align with Bandura's theory that experiences of success increase self-efficacy and influence the consistency of preventive behavior. Family motivation, risk awareness, principles of healthy living, and emotional support from fellow sex workers and family strengthen their commitment.[28] Previous studies also emphasize the role of social capital in supporting sustainable preventive behaviors.[17][21][28]

Informants with moderate self-efficacy (informant 1) have moderate magnitude and strength,

limited to certain clients, and narrow generality (only in safe situations). In contrast, informants with low self-efficacy (informant 4) show low magnitude, weak strength, and limited generality, leading to inconsistent preventive behavior, such as condom use. This condition indicates the need for interventions such as negotiation skills training and peer support to boost self-confidence.

Self-efficacy in VCT testing is still low (informants 1, 2, 3, & 4). Fear of results, anxiety, and the assumption that 'no symptoms mean healthy' are the main barriers despite their adequate knowledge.[29][30] Empathetic and non-judgmental healthcare interventions are essential to enhance confidence in regular VCT testing.

Decisional Balance and Behavioral Conflict

Research results show that the decision-making process for condom use among online sex workers is influenced by cost-benefit considerations (decisional balance).[31] The main reasons driving condom use are personal experiences of having had a sexually transmitted infection and fear of pregnancy (informants 1, 2, 3, & 4). This aligns with findings that negative experiences in the past often serve as strong motivating factors for behavioral change in prevention, especially among high-risk groups. Another benefit mentioned is maintaining overall health, which indicates an increased awareness of long-term health risks.

On the other hand, the main obstacles faced are decreased income due to clients renegotiating or refusing to use condoms, pressure from clients who desire unprotected relationships, and physical discomfort during sexual intercourse (informants 1, 2, 3, & 4). Some informants also acknowledge that there is still a sense of "bother" in using condoms, although this does not hinder the decision to continue using them as personal safety considerations are deemed more important (informants 1, 2, & 3). This decision-making is often influenced by perceptions of short-term losses, such as missed economic opportunities, compared to long-term health benefits.

Research findings indicate that the reasons for disease prevention and pregnancy are more dominant compared to obstacles such as client pressure or discomfort. This suggests that women's peer support with strong health and family motivation tend to be more consistent in preventive behaviors, while women's peer support that are heavily economically dependent on clients are more easily tempted by high payment offers, thus risking inconsistency. Further research using the Decisional Balance Proportion (DBP) approach can be employed to predict opportunities for behavioral change in a more measurable way, for instance, by giving greater weight to health and family reasons.[32] Practically, preventive interventions are recommended to implement personalized feedback and Motivational Interviewing techniques to reduce ambivalence, especially in individuals who are still in the preparation stage.[33] Strong health and community system support is essential for creating a sense of security, enhancing self-efficacy, and fostering an environment that encourages healthy behaviors.[34]

Conclusion

This study concludes that online sex workers in Semarang are at various stages of behavioral change in HIV/AIDS prevention, ranging from the *preparation* to *maintenance* stages. The application of the TTM successfully identified these stages and highlighted the influence of economic factors, self-efficacy, and decisional balance.

Most informants demonstrated an awareness of HIV risk, yet they continue to face psychological and social barriers that affect the consistency of their preventive behaviors. Based on the classification of stages, none of the informants were in the *pre-contemplation* stage all had moved past *contemplation*. One informant was at the *preparation* stage, one at the *action* stage, and half of the informants were in the *maintenance* stage. The informant at the *action* stage still encountered strong pressure from clients, which affected their consistency in condom use.

To address these barriers, health workers should provide counseling interventions. At the *preparation* and *action* stages, personalized feedback and negotiation skills training are needed to help them cope with client pressure. For those in the *maintenance* stage, continuous support through peer mentoring and regular monitoring is essential. Furthermore, cross-sectoral collaboration is required particularly in economic empowerment and stigma reduction to help sustain consistent HIV prevention behaviors over time.

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