

# Relationship between Extramarital Behavior and HIV: The Systematic Review and a Meta-Analysis Protocol

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## Abstract

**Objective:** Extramarital relations are among the main problems in the relationships of married couples that can result in psychological disorders, tensions between couples, and even physical problems in people involved. The risk of contracting sexually transmitted diseases, including HIV/AIDS, is high among the people who have extramarital relations. A large number of studies have addressed this issue, but there is no consistency in the results, and no research has reviewed them systematically. This study aims to depict a comprehensive image of the relationship between extramarital relationships and contracting HIV/AIDS.

**Method:** This systematic review will be conducted using Pubmed, PsycINFO, MEDLINE, EMBASE, Scopus, ProQuest, Web of Science, and Google Scholar, as well as the grey literature with no restriction regarding the language. All types of studies investigated the relationship between extramarital relations and HIV/AIDS will be included. The population of the study will be considered the people more than 18 years old with extramarital relationships in their lives at the time of research or before. Two independent reviewers will perform the study selection and data extraction. The assessment of the risk of bias will be implemented using the JBI Critical Appraisal Checklist. Publication bias will be assessed by funnel plots, Begg's, and Egger's tests. Heterogeneity will be evaluated using the I<sup>2</sup> statistic and the  $\chi^2$  test. Also, we will conduct subgroup analyses for the population and all Meta-analyses will be performed using Stata V.13 software.

**Conclusion:** The findings will revealed a comprehensive picture of the relation between extramarital relationships and HIV/AIDS that can improve policy decisions, leading to a reduction and providing improved special services for individuals, couples, and families, and society who faced this problem.

**Keywords:** Extramarital Behavior , HIV/AIDS, Systematic review, Meta-analysis, Protocol.

## Introduction

Infidelity is viewed as one of the most important and serious problems that married couples face (Webster, Brunel, & Pilkington, 2009). Although many aspects of emotional and sexual relationships have changed these days, monogamy has remained the only acceptable form of marital affairs, and infidelity is still viewed as a painful problem for married couples (Knight, 2010). So, we can say the problem of infidelity has been with us for a long

time, and betrayal is the chief cause of marriage destruction. (Hertlein, Wetchler, & Piercy, 2005).

About how widespread extramarital relationships are, there are different statistics. In the US, 26 to 70 percent of married women and 33 to 75 percent of married men who sought therapeutic help had extramarital affairs (Atkins, Baucom, Yi, & Christensen, 2005). Based on the reports made by therapists, 50% of men lie to their wives about this (Eavez & Robertson-Smith, 2007). For women, these statistics are 30% to 40%. For general public reports of infidelity are less than 15% for women and 22% for men (Miller & Moner, 2009). It is estimated that 21% to 70% of American women and 26% to 75% of American men had extramarital affairs, at least once, during their marital

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life (TaghiPour, Ismail, Wan Jaffar, & Yusop, 2019). Extramarital behavior irrecoverably influences intimate relationships and marital satisfaction (Allen & Atkins, 2012). This behavior causes mental health problems such as depression, anxiety, and post-traumatic stress disorder (Cano & O'Leary, 2000) and leads to the breakup of relations and separation (Allen & Atkins, 2012). Besides, extramarital relationships adversely affect the physical health of the persons involved and increase the risk of sexually transmitted diseases in them compared to the general public (Wu et al., 2019). sexual relationship between heterosexuals as well as using shared syringes among addicts are the chief cause of HIV/AIDS infections. But the infection by sexual activities is on the rise (Weller & Davis-Beatty, 2002). In China, also, extramarital relationships, which show a rising trend, are the chief cause of HIV/AIDS infections (Wu et al., 2019). Also, in developing countries extramarital relationships and having multiple sex partners, as well as polygamy, are the main causes of the transmission of diseases like AIDS (Wamoyi, Stobeanau, Bobrova, Abramsky, & Watts, 2016). In countries like Tanzania and South African Republic, 70% of people had at least one extramarital affair in their life (Mbago & Sichona, 2010). A change in people's attitude and modern lifestyle has increased the cases of extramarital affairs, and people tend to show a more lenient approach toward it (Wamoyi et al., 2016). It, in turn, increases the cases of diseases like HIV/AIDS among people. Unfortunately, extramarital relationships are one of the main factors that increase the risk of contracting AIDS from one's long-time sex partner. A study on the level of the transmission of HIV/AIDS among married couples shows that 22% of the cases were because one of the partners was the carrier of the disease as a result of having extramarital affairs (Wu et al., 2019). Although the risk of the transmission of diseases increases through having sexual matters both for single and married people, the probability of the transmission of the disease is higher in married people (Reniers & Tfaily, 2008). The reason here is that, despite single

persons that have sex with strangers, married people have a sense of immunity about contracting diseases. People underestimate the risk of contracting diseases from their spouses and fail to use protective means. Also, in some cultures, especially in under-developed countries, protective measures like using condoms and regular tests for married couples are less common, and especially women cannot ask for these protective measures (Coma, 2013). Underestimating the risk of disease transmission and failing to use protective means when having extramarital relationships increases the risk (Smith & Watkins, 2005).

Studies show the cases of women's HIV infection as a result of having extramarital relationships are high meaningfully (Mtenga et al., 2018). However, the risk of disease transmission through sexual activities is high for both men and women. Also, men have more extramarital affairs than women (Aloni, Mbago & Sichona, 2019). Although more biological factors put women more at risk, the data here show women have less access to protected sex as a result of cultural and patriarchic attitudes (Mtenga et al., 2018). It can be inferred that women who have extramarital relations are more at risk due to economic and cultural factors. As a result, they are more likely to contract diseases.

An important issue in this domain is about relationships by sex workers. Women who work as sex workers have a big role in transmitting HIV/AIDS infections (Huang, Maman, & Pan, 2012). There are more cases of HIV/AIDS carriers among sex workers and their clients. Their clients usually have unprotected marital and extramarital matters. They have a very active sexual life and their relationships are not limited to only one partner (Wu et al, 2019).

On the whole, based on the data obtained from the research, extramarital behavior is on the rise. Extramarital behavior is a mixture of long-time or short-time emotional and sexual relationships or both of them. Protection in these matters is often low, putting both the person and his/her short-time as well as lifetime partner at risk (Choi, Catania, Dolcini, & Sample, 2003).

The extent of this behavior and the role it has in the worldwide spread of HIV/AIDS has been the subject of different studies in different parts of the world. But the data obtained cannot help us form a comprehensive picture of this phenomenon. We do not know how strong this relationship is. We do not know whether its risk decreases or increases as time goes by, which part of the world will have more cases, or whether there is any difference between men and women in contracting this disease. And if there is a difference, what is the reason.

So far, other risky sexual behaviors and the relationship thereof and HIV/AIDS have been the subject of systematic reviews. For example, a systematic review of the HIV/AIDS infection in women sex workers in both developed and developing countries has revealed that, although there are differences between developed and developing countries, sex workers show to have a high level of infection (Robert Cronin, Nicholas Dias, & Yung Peng, 2017). There is another study about sexual intercourse through sexual organs and the level of HIV/AIDS infection, and a meaningful correlation was found in women (Wamoyi et al., 2016). Another systematic review of sexual relationships between homosexuals and the extent to which they contract HIV/AIDS has revealed that there is a meaningful correlation in men (Bonell, Weatherburn, & Hickson, 2000).

Our search had revealed the fact that despite the significance of the correlation between extramarital behavior and contracting HIV/AIDS, there has been no systematic review in this regard. Accordingly, in this study, we decided to systematically review all studies carried out on the subject of all types of extramarital behavior and HIV/AIDS between 1980 and 2019. The results can help us recognize people who are more at risk and help us adopt preventive and treatment policies at all levels.

## Method

The present study will be conducted based on the guidelines introduced by the PRISMA-P checklist.

The study protocol is published in the author's research gate profile (Malekasgar, 2020).

## Eligibility criteria

### Design of study

In this systematic review, we will consider all previous studies that investigated the relation/correlation between extramarital behavior and HIV/AIDS. These studies will include incidence study, observational surveys, cohort, cross-sectional studies, and correlational studies that investigated the relationship between extramarital behaviors and HIV. We will consider the studies that investigate extramarital behavior quantitatively and there will be no limitation regarding the kind of relationship and the language. We will not evaluate the studies focusing on this relationship in specific demographic groups and homosexual couples.

### Population

The married people, who aged more than 18 years old and had extramarital relationships at the time of study or before, will be considered as the population of the research. There will be no limitations regarding gender, nationality, sexual orientation, or psychological problems.

### Exposure and Outcome

In the present study, the relationship between extramarital behavior and HIV/AIDS will be investigated. Any research that assessed this variable and analyzed its relationship with HIV/AIDS in any method, regardless of its definition for an extramarital behavior, will be included.

### Search Strategy

Four search strategies will be used to identify as much relevant literature as possible. Firstly, the literature without the limitation of language will be searched from 1989/01/01 to 2019/12/31 in the databases, including Pubmed, PsycINFO, MEDLINE, EMBASE, Scopus, ProQuest, Web of Science, and Google Scholar. Proper keywords will be determined using the thesaurus databases such as ENTREE and MeSH, as well as the three-step search method. The keywords will be

include: (HIV) OR (HIV infection) OR (Acquired Immunodeficiency Syndrome) OR (AIDS) AND (sexually transmitted infection) AND (Acquired) OR (immunodeficiency) AND (acquired) AND (affair) OR (betrayal) OR (extra-marital) OR (extramarital relationship) OR (extramarital involvement) OR (extramarital affair) OR (extramarital sex) OR (extramarital behavior) AND (Couple) OR (pair) OR (spouse) OR (marital) OR (sex) OR (Sexuality) OR (woman) OR (women) OR (man) OR (men) OR (Husband) OR (Wives) OR (Wife) OR (relation) OR "Spouses"[Mesh]). The search strategy in the Pubmed database is shown in Table 1. The syntax will be adopted from other databases.

The second strategy will consist of searching the reference lists of any studies selected for inclusion in the final review to identify relevant articles that may have been missed by the electronic database search and also the reference list of previous reviews. With the help of this procedure, the studies missed through electronic database search will be found. During the third procedure, other resources such as conference papers and dissertations will be taken into account. Finally, the key journals in this domain will be reviewed.

## Data collection

**Table 1:** search syntax for PubMed Infidelity

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(AIDS [tiab] OR HIV [tiab] OR "Acquired Immunodeficiency Syndrome"[Mesh] OR (Immun*[tiab] AND Acquired [tiab] AND Syndrome*[tiab] ) OR (immunodeficiency [tiab] AND acquired [tiab]))
AND
(Treas*[TIAB] OR treac*[TIAB] OR infidelity [TIAB] OR extra-marital [TIAB] OR extramarital [TIAB] OR "Extramarital Relations"[Mesh] OR Adultery [TIAB] OR extramarital involvement [TIAB] ) OR extramarital affair [TIAB] OR extramarital sex [TIAB] OR extramarital behavior [TIAB] OR extramarital involvement [TIAB]
AND
(Couple*[TIAB] OR pair [TIAB] OR spouse*[TIAB] OR marital [TIAB] OR sex[TIAB] OR Sexuality[TIAB] OR woman[TIAB] OR women[TIAB] OR man [TIAB] OR men [TIAB]
OR Husband*[TIAB] OR Wives [TIAB] OR Wife [TIAB] OR relation*[TIAB] OR "Spouses"[Mesh])
```

## Selection process

After a systematic search in the sources, we will give

the output of Mendeley software to two evaluators. In the first screening stage, the two evaluators will assess the studies and categorize them into three groups: relevant, irrelevant, and uncertain. The studies identified as irrelevant by both evaluators will be excluded. Then, every evaluator will have a probable list of the studies which are considered to be relevant and uncertain. Any potential disagreement will be resolved by consensus between the two reviewers.

## Data extraction

In the next step, two evaluators will receive the full text of all the relevant studies and will be decided on considering the studies based on the protocol criteria. The disagreements will be resolved by consensus between the two reviewers. The two reviewers will independently extract data based on the desired information of designed forms. The required information that will be extracted: study information data (first author's name, year of publication, journal name, study design, methodology, geographical location, funding source) and demographic data (gender, age, sample size, type extramarital relationship, marital information, HIV test characteristic, test result education level, and socioeconomic status, subgroups and study period).

To evaluate and select the effect size, the following

statistics will be used; 1) correlation coefficient, 2) Mean difference index, or standardized mean

difference. In the studies in which these indexes are not reported directly, the following six variables will be used; variable, sample size, the mean, standard deviation, independent variable or its subcategories. Also, as the studies presented the required information by the diagram, we will use the WebPlot Digitizer to extract the relevant numerical data. Furthermore, the author will ask the researchers to give the information by correspondence in the case of a lack of the required information in the reviewed studies. The correspondence will be repeated three times, and the study will be excluded in the case of receiving no response.

### **Data analysis**

The data will be combined by Metaprob order in Stata software version 13. One of the relative risk indicators (Risk ratio or odds ratio) will be used for the measure of effect size. Furthermore, the standard mean differences will be used for combining quantitative data.

### **Methodological quality assessment**

Joanna Briggs Institute Checklist will be used to evaluate the studies concerning their methodologies. Two experts will answer the questionnaire about each study independently and the potential disagreement between the two reviewers will be resolved by consensus.

### **Heterogeneity assessment**

Q Cochrane test, p-value, and I<sup>2</sup> will be used to investigate the heterogeneity of the results. Higgins classification will be applied to categorize heterogeneity: 0 to 24.9 for slight heterogeneity, 25 to 49.9 for medium heterogeneity, 50 to 74.9 for severe heterogeneity, and 75 to 100 for highly severe heterogeneity.

### **Assessment of Publication Bias**

Funnel chart and Beg and Eger statistical test will be used to evaluate publication bias. As the p-value is obtained less than  $P < 0.10$ , bias probability will be considered being high. "One out remove" method will be applied to analyze sensitivity (using Metannif

order in Ista software). Also, we will use meta-regression or subgroup analysis methods to evaluate the effect of methodological quality on the results of the reviewed studies. If a significant difference will be observed between the results of high and low-quality studies, the final result will be presented by combining the results of previous studies.

### **Discussion**

In this study, the analysis will be focused on all studies conducted between 1980 and 2019 evaluating the relationship between extramarital relationships and HIV/AIDS. Although the data-driven from these studies have been obtained via various timeframes and populations as well as different age and sex groups, the results of such studies will help us depict a more accurate image of the form and amount of the correlation between extramarital relationships and HIV infection. Such a depiction will pave the way for macro decision-making in both treatment and prevention. The data from the current situation will lead us towards more accurate predictions for the future. This study will shed light on the risks of HIV infection through paralleled sexual relationships in general all over the world. Furthermore, the accuracy and precision in the data obtained from specific groups will help identify the population at risk to employ any preventive measures for them in the next steps.

### **Limitation**

We anticipate that this systematic review will have limitations such as significant heterogeneity and imprecision for some of the outcomes, which limited our confidence in the estimates of effect. As a result, we may find out that for many findings, at this time, we are unable to make any conclusions with a high degree of confidence. An additional limitation is that historically, there has been no accurate and fixed definition of what extramarital behavior is. Thus, using a variety of definitions may still be significantly conceptual heterogeneity, which may affect the interpretation of any results.

### Ethics approval and consent to participate

Ethics approval is not required for a systematic review of secondary data.

### References

- Allen, E. S., & Atkins, D. C. (2012). The Association of Divorce and Extramarital Sex in a Representative U.S. Sample. *Journal of Family Issues*, 33(11), 1477–1493. <https://doi.org/10.1177/0192513X12439692>
- Aloni, M., Mbago, M. C., & Sichona, F. J. (2019). Understanding The Combined Effects Of The Knowledge Of HIV/AIDS Prevention Methods On Condom Use: A Case Of Njombe And Tanga Regions Of Mainland Tanzania. *Hiv/aids (Auckland, NZ)*, 11, 265.
- Atkins, D. C., Baucom, D. H., Yi, J., & Christensen, A. (2005). Infidelity in couples seeking marital therapy. *Journal of Family Psychology*, 19(3), 470–473. <https://doi.org/10.1037/0893-3200.19.3.470>
- Cano, A., & O’Leary, K. D. (2000). Infidelity and separations precipitate major depressive episodes and symptoms of nonspecific depression and anxiety. *Journal of Consulting and Clinical Psychology*, 68(5), 774–781. <https://doi.org/10.1037/0022-006X.68.5.774>
- Coma, J. C. (2013). When the group encourages extramarital sex: Difficulties in HIV/AIDS prevention in rural Malawi. *Demographic Research*, 28, 849–880. <https://doi.org/10.4054/DemRes.2013.28.30>
- Eaves, S. H., & Robertson-Smith, M. (2007). The relationship between self-worth and marital infidelity: A pilot study. *The Family Journal*, 15(4), 382–386.
- Huang, Y., Maman, S., & Pan, S. (2012). Understanding the diversity of male clients of sex workers in China and the implications for HIV prevention programs. *Global public health*, 7(5), 509–521.
- Hertlein, K. M., Wetchler, J. L., & Piercy, F. P. (2005). Infidelity: an overview. *Journal of Couple & Relationship Therapy*, 4(2-3), 5–16.
- Knight, E. A. (2010). Gender differences in defining infidelity. Humboldt State University. Retrieved from <http://humboldt-dspace.calstate.edu/handle/2148/651>
- Maner, J. K., Gailliot, M. T., & Miller, S. L. (2009). The implicit cognition of relationship maintenance: Inattention to attractive alternatives. *Journal of Experimental Social Psychology*, 45(1), 174–179.
- Mbago, M. C., & Sichona, F. J. (2010). Determinants of extramarital sex by men in Tanzania: A case study of the Mbeya region. *Sahara J*, 7(4), 33–38. <https://doi.org/10.1080/17290376.2010.9724975>
- Mtenga, S. M., Pfeiffer, C., Tanner, M., Geubbels, E., & Merten, S. (2018). Linking gender, extramarital affairs, and HIV: a mixed-methods study on contextual determinants of extramarital affairs in rural Tanzania. *AIDS Research and Therapy*, 1–17. <https://doi.org/10.1186/s12981-08-0199-6>
- Robert Cronin, Nicholas Dias, Yung Peng, R. K. (2017). Prevalence of HIV Among U.S. Female Sex Workers: Systematic Review and Meta-analysis. *Physiology & Behavior*, 176(3), 139–148. <https://doi.org/10.1016/j.physbeh.2017.03.040>
- Reniers, G., and Tfaily, R. (2008). Polygyny and HIV in Malawi. *Demographic Research* 19(53): 1811–1830
- Smith, K. P., & Watkins, S. C. (2005). Perceptions of risk and strategies for prevention: responses to HIV/AIDS in rural Malawi. *Social science & medicine*, 60(3), 649–660.
- TaghiPour, M., Ismail, A., Wan Jaffar, M., & Yusop, Y. M. (2019). Infidelity in Marital Relationships. *Psychology & Psychological Research International Journal*, 4(2). <https://doi.org/10.23880/pprij-16000200>
- Wamoyi, J., Stobeanau, K., Bobrova, N., Abramsky, T., & Watts, C. (2016). Transactional sex and risk for HIV infection in sub-Saharan Africa: A systematic review and meta-analysis. *A Journal of the International AIDS Society*, 19(1). <https://doi.org/10.7448/IAS.19.1.20992>
- Weller, S. C., & Davis-Beatty, K. (2002). Condom effectiveness in reducing heterosexual HIV transmission. *Cochrane Database of Systematic Reviews*, (4). <https://doi.org/10.1002/14651858.cd003255>
- Wu, P., Dong, W. M., Rou, K., Dong, W., Zhou, C., Chen, X., Wu, Z. (2019). HIV-positive clients of female sex workers in Hunan Province, China: A mixed-methods study assessing sexual relationships and risk behavior by type of partner. *BMC Public Health*, 19(1), 1–9. <https://doi.org/10.1186/s12889-019-7446-1>
- Webster, G. D., Brunell, A. B., & Pilkington, C. J. (2009). Individual differences in men’s and women’s warmth and disclosure differentially moderate couples’ reciprocity in conversational disclosure. *Personality and Individual Differences*, 46(3), 292–297.