REVIEW PAPER

# Compliance of published cross-sectional studies on pregnancy decision-making in women living with HIV/AIDS with STROBE statement: a critical appraisal of the literature

Mona Larki[1,2], Elham Manouchehri[3], Fatemeh Godarzi[4], Zahra Hadizadeh Talasaz[1,2], Robab Latifnejad Roudsari[1,2]

[1]Nursing and Midwifery Care Research Center, Mashhad University of Medical Sciences, Mashhad, Iran
[2]Department of Midwifery, School of Nursing and Midwifery, Mashhad University of Medical Sciences, Mashhad, Iran
[3]Department of Nursing and Midwifery, MMS.C., Islamic Azad University, Mashhad, Iran
[4]Medicinal Plants Research Center, Yasuj University of Medical Sciences, Yasuj, Iran

## Abstract

**Introduction:** Critical appraisal is a key step in the process of evidence-based practice. Strong evidence is required for decisions on patient care and policy-making, and high-quality studies are vital for developing the foundation of evidence-based medicine. This study aimed to assess the compliance of published cross-sectional studies regarding pregnancy decision-making in women with human immunodeficiency virus (HIV)/acquired immunodeficiency syndrome (AIDS).

**Material and methods:** In this critical review, the search was performed through English databases including PubMed, Web of Science, PsycINFO, ProQuest, Scopus and Google Scholar search engine, without a time limit until the end of September 2022 with the keywords of HIV, AIDS, HIV seropositivity, acquired immune deficiency syndrome, women, pregnancy, reproductive health, decision-making, contraceptive methods, and family planning. Finally, 38 English articles were critically appraised using the STROBE checklist. The collected data were analyzed with SPSS software (version 22).

**Results:** The overall compliance rate with the STROBE statements was 77.36%. Introduction was the section with the highest level of compliance (98%) and results was the section with the lowest level of compliance (60.69%). 27 studies (71.05%), had good and 11 studies (28.94%) had moderate quality. The publication of the STROBE statement has not had a significant effect on the overall quality score of published studies ($p = 0.14$).

**Conclusions:** It is suggested that not only medical journals use the STROBE statement to evaluate articles but also the researchers adhere to its standard principles when preparing and submitting articles.

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**Key words:** cross-sectional studies, HIV, AIDS, women, pregnancy.

**Address for correspondence:** Robab Latifnejad Roudsari, Department of Midwifery, School of Nursing and Midwifery, Mashhad University of Medical Sciences, Mashhad, Iran, e-mail: rlatifnejad@yahoo.com; latifnejadr@mums.ac.ir

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## Introduction

Knowledge of disease symptoms, pathogenesis, diagnosis, prognosis, and treatment is required for rational healthcare practices [1]. Observational studies provide an abundance of clinical knowledge in the field of public health as well as solutions to many issues in the area of medical research. Almost nine out of ten research articles published in specialized clinical journals are observational studies [1, 2]. Most observational studies are useful for finding rare or late side effects of treatment, and their results are more likely to be similar to those that occur in the real medical world [3]. Decisions about patient care and policy-making require strong evidence. The volume, speed, and accuracy of observational data obtained from electronic health records and data networks can be an opportunity to meet this demand [4]. Despite the importance of observational research, it appears that its reports are insufficiently accurate and clear to examine its strengths and weaknesses [5]. It was found that in published observational research, important information are often unclear or missing. The findings of a survey investigating epidemiological studies published in specialized and medical journals, revealed that intervening variables were frequently not mentioned [6]. Only a few case-control studies in psychiatry discussed the method used to select cases and controls [7]. As a result, despite the increased data access, clinical and non-clinical decision-makers may dismiss observational research due to the lack of awareness of methodologies used, or variances in study quality [8]. Inadequate reporting of details reduces findings' assurance, makes it harder to replicate the study, and diminishes the accuracy of available data when carrying out crucial review studies, such as meta-analyses [9].

The STROBE checklist has been established to improve and strengthen the reports of observational research, including cohort, case-control, and cross-sectional studies [1]. This tool has been created by a 23-member team of editors, epidemiologists, statisticians, methodologists, and doctors from Europe and North America [10]. An instruction from the words "Strengthening the Reporting of Observational Studies in Epidemiology" was published for the first time in the *Lancet*, *Annals of Internal Medicine*, *Epidemiology*, and *PLoS Medicine* in 2007 [10]. Critical appraisal is an essential skill in evidence-based practice, leading to integration of the best evidence into clinical care. Therefore, when reviewing any type of evidence, it is critical to evaluate all aspects of study design, implementation, and reporting before it is used [11]. Several studies employed the STROBE statement to evaluate the quality of reports of observational studies in the field of medical sciences [12-14].

The Joint United Nations Program on HIV/AIDS (UNAIDS) 2022 estimates that 38.4 million people worldwide are infected with human immunodeficiency virus (HIV). 53% of all HIV-positive people were women and girls, and they accounted for 46% of all new infections in 2022 [15]. HIV is a complex disease with significant medical and social consequences, and is currently recognized as a chronic and manageable infection. Although there is a lot of information about the best HIV care practices, data about scientific accuracy or standards, which must be met before practice are still lacking [16].

Motherhood is a significant role that provides meaning to the lives of many women; however, decisions regarding pregnancy and childbearing are frequently complicated due to the impact of HIV on numerous aspects of daily life [17]. Based on UNAIDS, women living with HIV should be encouraged to choose pregnancy as a realistic goal in their lives, but the training of healthcare providers is required to deliver preventive strategies, including the timing of conception and antiretroviral treatments [18].

Therefore, it is necessary to pay attention to HIV-infected women's fertility decisions to obtain an integrated, comprehensive, and multidisciplinary approach in the field of reproductive health, and to establish care programs for them. In order to do so, it is critical to select research that is of high quality, thus healthcare providers, policy-makers, decision-makers, and researchers can share the best HIV care practices, aiming to promote creative, successful, and sustainable solutions, and based on their successes and experiences, improve patient outcomes [16].

Considering aforementioned issues, and the fact that cross-sectional studies are research projects with increasing importance in evidence-based medicine (EBM) [19] as well as the need to designing observational studies to generalize the results in the community, the present study aimed to assess the compliance of the published cross-sectional studies regarding pregnancy decision-making in women with HIV/acquired immunodeficiency syndrome (AIDS) with STROBE statement.

## Material and methods

The current critical review aimed to critically appraise cross-sectional studies on pregnancy decision-making in HIV/AIDS women through examining its compliance with the STROBE statement.

### Search methods and strategies for the identification of studies

An online search of English databases, including PubMed, Web of Science, PsycINFO, ProQuest, and Scopus as well as Google Scholar search engine, was performed. Also, manual search of the reference lists of all reviewed articles was conducted. In this study articles were searched using the following key words: "HIV", "AIDS", "HIV seropositivity", "AIDS", "Acquired immune deficiency syndrome", "Women", "Pregnancy", "Reproductive health", "Reproduction", "Decision-making", "Contraceptive method", and "Family planning". No time restriction until the end of January 2023 was used. To increase precision in the search process, Boolean terms (AND/OR) were employed to separate the key words as well as medical subject headings (MeSH).

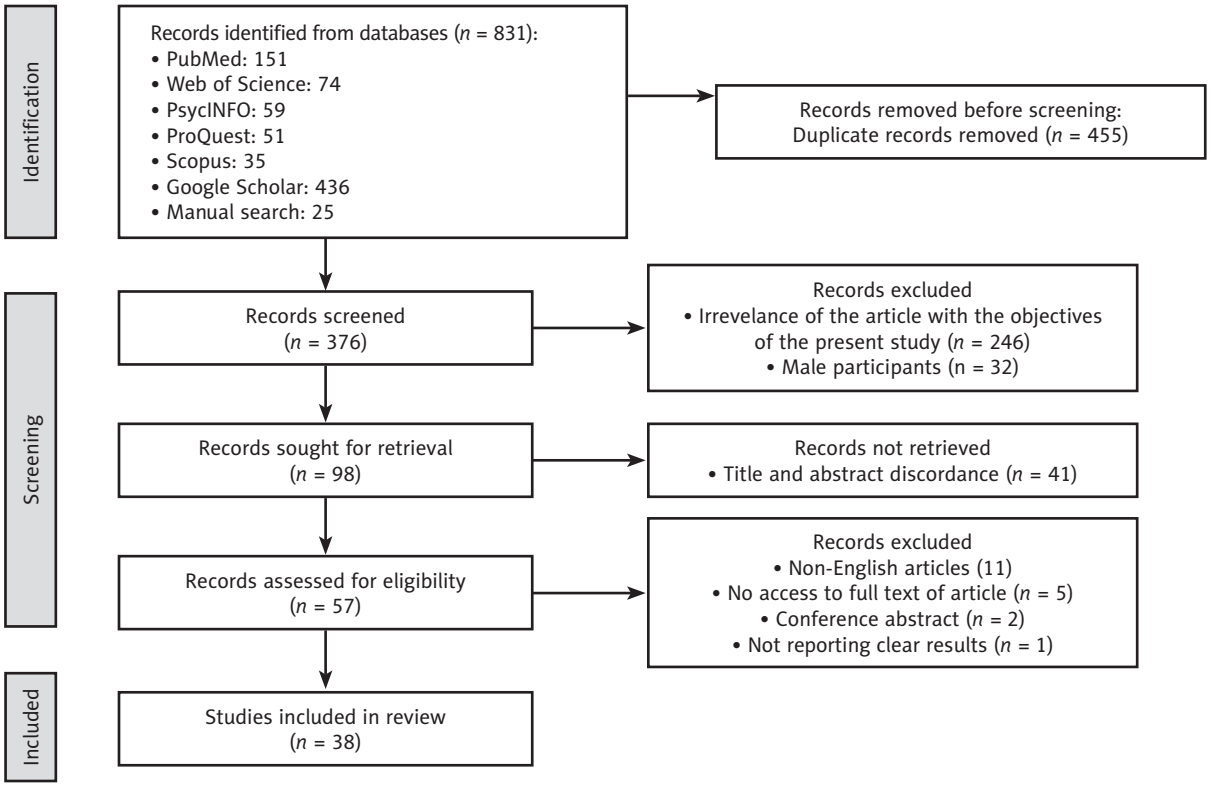


**Figure 1.** PRISMA 2021 flowchart of the process of selecting articles

The strategy for selecting studies consisted of three steps, i.e., identifying all related literature, screening abstracts for eligibility and exclusion criteria, and finally including the selected studies in the review process. In Figure 1, the number of records retrieved and included in each of these steps are presented. The process of obtaining articles was in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines (2021) [20].

## Inclusion and exclusion criteria for studies

Inclusion criteria were cross-sectional studies in English language, with the purpose of determining pregnancy decisions among women with HIV, and age ranging between 18 and 49 years. Exclusion criteria were no access to full-text articles, studies conducted on men, letters to the editor, commentaries, reviews, and case reports.

## Data extraction and management of studies

Titles and abstracts of articles were reviewed independently by two authors (M.L., F.G.), and any inconsistencies were discussed with a third author (E.M.). There was only one disagreement about the inclusion of articles with the same population. The STROBE checklist for cross-sectional studies was used for the critical appraisal of articles, which consists of six general sections: 1) title and abstract; 2) introduction; 3) methods; 4) results; 5) discussion; and 6) other information [21]. Some of these titles were divided into sub-groups and in total, it contained 22 general topics. In some items, several topics are mentioned collectively in one item. For example, in the second part of research method, sampling location, duration of sampling, exposure, and duration of data collection are mentioned in one sentence. It is notable that for more detailed examination and correct scoring, similar to previous studies, they were separated [22] for appraisal [23].

In this study, these 22 items were divided into 47 smaller items for a more detailed investigation and possibility of comparing the quality of results of the studies with each other. Out of 22 items, 1 was about how to write the title and summary, 2 were about the introduction, 9 were on materials and methods, 5 were about results, 4 were on discussion, and 1 was about the source of funding. For each statement, three options, such as "Reported", "Not reported," and "Not applicable" were considered. Each statement item in this study was assigned a score of 0 (meaning, not reported or not applicable in the article) or 1 (meaning, the item was reported in the article). In this way, for the first part ("Title and abstract"), a maximum of 2 marks accrue; for the second part ("Introduction"), a maximum of 3 marks; for the third part ("Method"), a maximum of 23 marks; for

the fourth part ("Results"), a maximum of 13 marks; and for the fifth part ("Discussion"), a maximum of 5 marks could be assigned. The score and the final section ("Other information") each could have a maximum score of 1, while each article received a total score of 0-47 [24]. To present the results qualitatively, obtained grades were divided into three categories: poor (score, 0-15), moderate (score, 16-31), and good (score, 32-47).

Subsequently, Statistical Package for Social Science (SPSS, IBM, USA), version 22, was employed to evaluate the data using descriptive statistical methods, such as mean and standard deviation as well as inferential methods, such as Kruskal-Wallis test.

### Ethical consideration

All legal rights to the authors' publications were taken into consideration. Each article was reviewed during the initial screening. Articles, which did not meet the inclusion criteria were excluded from the study. Moreover, the authors adhered to ethical considerations, including avoiding plagiarism and ensuring the accuracy of data extraction, preparation, and submission.

## Results

At first, all 806 articles obtained through the search and 25 articles identified using the manual search of other articles (831 in total) were recorded in the EndNoteX8 software. After removing duplicates, 376 articles entered the screening stage, where 338 articles were excluded. The reasons for excluding were the following: 246 articles were not related to the objectives of the present study, 32 articles' participants were men, and the title and abstract of 41 articles were irrelevant. In total, there were 11 non-English articles, which access to full texts of five articles was not possible, two articles were only conference abstracts, and one article did not clearly state the results. Finally, 38 articles were included in the review study.

The quality of 38 cross-sectional articles on pregnancy decision-making in women with HIV/AIDS was critically appraised. All papers were English-written, and indexed in the first index journal. The general characteristics of the articles included are listed in Table 1. The highest index of articles was considered. Moreover, the results of assessing the quality of articles based on all items in the STROBE statement checklist are presented in Table 2. Based on the calculations, Table 3 and Figure 2 demonstrate how well the quality of each part of the assessment is met by the articles according to the STROBE statement criteria. The highest compliance was in the introduction part (98%), and the lowest was in the results section (60.69%). The overall agreement rate between the reports of the selected articles and the statements in the current study was 77.36% (Figure 2). The Kruskal-Wallis test revealed no statistically significant difference between the quality of different parts of the articles, such as title and abstract: $p = 0.2$, introduction: $p = 0.07$, method: $p = 0.5$, discussion: $p = 0.3$, other information: $p = 0.6$, and the year of publication.

Additionally, the Kruskal-Wallis test showed that there was not a statistically significant difference between the quality of different parts of the articles, including title and abstract: $p = 0.12$, introduction: $p = 0.19$, method: $p = 0.08$, results: $p = 0.6$, discussion: $p = 0.2$, other information: $p = 0.06$, and the number of authors. There was no statistically significant difference in the overall quality score between different years ($p = 0.43$). However, a statistically significant difference was observed between the quality of results and the year of publication ($p = 0.02$). In none of the assessed articles, the estimates of relative risk in the absolute risk (item 40) was reported. The use of a flow diagram (item 31) was considered in three articles.

All the studies declared the following 5 items in their reports: 1. Provide an informative and balanced summary of what was done and found (item 2); 2. Explain the scientific background (item 3); 3. Provide the rationale for the investigation (item 4); 4. Present key elements of study design early in the article (item 6); and 5. Describe the study's setting and location (item 7). The results of the overall assessment of the quality of these articles showed that 11 studies (28.94%) were of moderate quality, 27 studies (71.05%) were of good quality, and there were no poor-quality papers (Table 4).

## Discussion

The current study aimed to assess the compliance of published cross-sectional studies regarding pregnancy decision-making in women with HIV/AIDS. We compared our results to studies in other medical fields, which used

**Table 1.** General characteristics of the published cross-sectional studies on pregnancy decision-making in women with HIV/AIDS

| General characteristics | *n* (%) |
|---|---|
| Index of journal | |
| ISI, PubMed | 38 (100.0) |
| Only Scopus | 0 (0) |
| ISC and other | 0 (0) |
| Language | |
| English | 38 (100.0) |
| Other languages | 0 (0) |
| Year of publication | |
| Before 2000 | 5 (13.2) |
| 2000-2010 | 11 (28.9) |
| 2011-2022 | 22 (57.9) |
| Number of authors | |
| 1-4 | 19 (50.0) |
| 5-8 | 15 (39.5) |
| Above 8 | 4 (10.5) |

**Table 2.** Quality of reports of the published cross-sectional studies on pregnancy decision-making in women with HIV/ AIDS according to the STROBE statement

| No. | Item STROBE checklist | Recommendation | Reported, *n* (%) | Not reported, *n* (%) | Not applicable, *n* (%) | Mean (SD) |
|---|---|---|---|---|---|---|
| **1. Title and abstract** | | | | | | |
| 1 | 1A | Indicate the study design in the title or the abstract section using common terms | 27 (71.1) | 11 (28.9) | 0 (0) | 0.71 (0.46) |
| 2 | 1B | In the abstract, provide an informative and balanced summary of what was done and found | 38 (100.0) | 0 (0) | 0 (0) | 1 |
| **2. Introduction** | | | | | | |
| 3 | 2A | Explain the scientific background | 38 (100.0) | 0 (0) | 0 (0) | 1 |
| 4 | 2B | Rationale for the investigation | 38 (100.0) | 0 (0) | 0 (0) | 1 |
| 5 | 3 | State specific objectives, including any prespecified hypotheses | 36 (94.7) | 2 (5.3) | 0 (0) | 0.95 (0.22) |
| **2. Methods** | | | | | | |
| 6 | 4 | Present key elements of the study design early in the article | 38 (100.0) | 0 (0) | 0 (0) | 1 |
| 7 | 5A | Describe setting and location | 38 (100.0) | 0 (0) | 0 (0) | 1 |
| 8 | 5B | Periods of recruitment | 33 (86.8) | 5 (13.2) | 0 (0) | 0.87 (0.05) |
| 9 | 5C | Time of exposure | 12 (31.6) | 11 (28.9) | 15 (39.4) | 0.32 (0.47) |
| 10 | 5D | Follow-up time | 16 (42.1) | 20 (52.6) | 1 (2.6) | 0.47 (0.55) |
| 11 | 6A | Provide eligibility criteria | 37 (97.4) | 1 (2.6) | 0 (0) | 0.97 (0.16) |
| 12 | 6B | Sources and methods of participants' selection | 32 (84.2) | 6 (15.8) | 0 (0) | 0.84 (0.37) |
| 13 | 7A | Clearly define all outcomes | 33 (86.8) | 5 (13.2) | 0 (0) | 0.87 (0.34) |
| 14 | 7B | Clearly define all exposures | 18 (42.4) | 20 (52.6) | 0 (0) | 0.47 (0.50) |
| 15 | 7C | Clearly define potential confounders | 28 (73.7) | 10 (26.3) | 0 (0) | 0.74 (0.44) |
| 16 | 7D | Provide diagnostic criteria, if applicable | 30 (78.9) | 8 (21.1) | 0 (0) | 0.79 (0.41) |
| 17 | 8A | Mention data collection sources | 35 (92.1) | 3 (7.9) | 0 (0) | 0.92 (0.10) |
| 18 | 8B | Details of assessment methods (measurement) | 9 (23.7) | 29 (76.3) | 0 (0) | 0.24 (0.43) |
| 19 | Nc | Describe comparability of assessment methods if there is more than one group | 29 (76.3) | 9 (23.7) | 0 (0) | 0.76 (0.43) |
| 20 | 9 | Describe any efforts to address potential sources of bias | 31 (81.6) | 7 (18.4) | 0 (0) | 0.82 (0.39) |
| 21 | 10 | Explain how the study size was arrived at | 21 (57.9) | 16 (42.1) | 0 (0) | 0.58 (0.50) |
| 22 | 11A | Explain how quantitative variables were handled in the analyses | 36 (94.7) | 2 (5.3) | 0 (0) | 0.95 (0.22) |

**Table 2.** Cont.

| No. | Item STROBE checklist | Recommendation | Reported, *n* (%) | Not reported, *n* (%) | Not applicable, *n* (%) | Mean (SD) |
|---|---|---|---|---|---|---|
| 23 | 11B | If applicable, describe which groupings were chosen and why | 25 (65.8) | 13 (34.2) | 0 (0) | 0.66 (0.48) |
| 24 | 12A | Describe all statistical methods, including those used to control for confounding | 31 (81.6) | 7 (18.4) | 0 (0) | 0.82 (0.39) |
| 25 | 12B | Describe any methods used to examine sub-groups and interactions | 30 (78.9) | 8 (21.1) | 0 (0) | 0.79 (0.41) |
| 26 | 12C | Explain how missing data were addressed | 9 (23.7) | 29 (76.3) | 0 (0) | 0.24 (0.43) |
| 27 | 12D | If applicable, describe analytical methods taking into account sampling strategy | 14 (36.6) | 23 (60.5) | 1 (2.6) | 0.42 (0.55) |
| 28 | 12E | Describe any sensitivity analyses | 31 (81.6) | 7 (18.4) | 0 (0) | 0.82 (0.39) |
| **4. Results** | | | | | | |
| 29 | 12E | Report numbers of individuals at each stage of study | 27 (71.1) | 11 (28.9) | 0 (0) | 0.71 (0.46) |
| 30 | 13A | Provide reasons for non-participation at each stage | 19 (50.0) | 19 (50.0) | 0 (0) | 0.5 (0.50) |
| 31 | 13C | Consider using of a flow diagram | 3 (7.9) | 35 (92.1) | 0 (0) | 0.08 (0.27) |
| 32 | 14A (1) | Provide characteristics of study participants | 38 (100.0) | 0 (0) | 0 (0) | 1 |
| 33 | 14A (2) | Information on exposures and potential confounders | 33 (86.8) | 5 (13.2) | 0 (0) | 0.87 (0.34) |
| 34 | 14B | Indicate number of participants with missing data for each variable of interest | 9 (23.7) | 29 (76.3) | 0 (0) | 0.24 (0.43) |
| 35 | 15 | Report number of outcome events or summary measures | 37 (97.4) | 1 (2.6) | 0 (0) | 0.97 (0.16) |
| 36 | 16A (1) | Provide unadjusted estimates (e.g., 95% confidence interval) | 32 (84.2) | 6 (15.8) | 0 (0) | 0.84 (0.37) |
| 37 | 16A (2) | If applicable, provide confounder-adjusted estimates and their precision | 30 (78.9) | 8 (21.1) | 0 (0) | 0.79 (0.41) |
| 38 | 16A (3) | Clarify which confounders were adjusted for and reasons for inclusion | 4 (10.5) | 34 (89.5) | 0 (0) | 0.11 (0.31) |
| 39 | 16B | Report category boundaries when continuous variables were categorized | 25 (65.8) | 7 (18.4) | 6 (15.8) | 0.97 (0.59) |
| 40 | 16C | If relevant, consider translating estimates of relative risk into absolute risk for a meaningful time period | 0 (0) | 38 (100.0) | 0 (0) | – |
| 41 | 17 | Report other analyses done, e.g., analyses of sub-groups, interactions, and sensitivity | 31 (81.6) | 7 (18.4) | 0 (0) | 0.82 (0.39) |

**Table 2.** Cont.

| No. | Item STROBE checklist | Recommendation | Reported, *n* (%) | Not reported, *n* (%) | Not applicable, *n* (%) | Mean (SD) |
|---|---|---|---|---|---|---|
| **5. Discussion** | | | | | | |
| 42 | 18 | Summarize key results with reference to study objectives | 36 (94.7) | 2 (5.3) | 0 (0) | 0.95 (0.22) |
| 43 | 19A | Discuss study's limitations taking into account sources of potential bias or imprecision | 36 (94.7) | 2 (5.3) | 0 (0) | 0.95 (0.22) |
| 44 | 19B | Discuss both direction and magnitude of any potential bias | 21 (55.3) | 17 (44.7) | 0 (0) | 0.55 (0.50) |
| 45 | 20 | Provide a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies, and other relevant evidence | 37 (97.4) | 1 (2.6) | 0 (0) | 0.97 (0.16) |
| 46 | 21 | Discuss generalizability (external validity) of the study results | 29 (76.3) | 9 (23.7) | 0 (0) | 0.76 (0.43) |
| **6. Other information** | | | | | | |
| 47 | 22 | Provide source of funding and role of funders in the study, and if applicable, for the original study on which the present article was based | 31 (81.6) | 7 (18.4) | 0 (0) | 0.82 (0.39) |

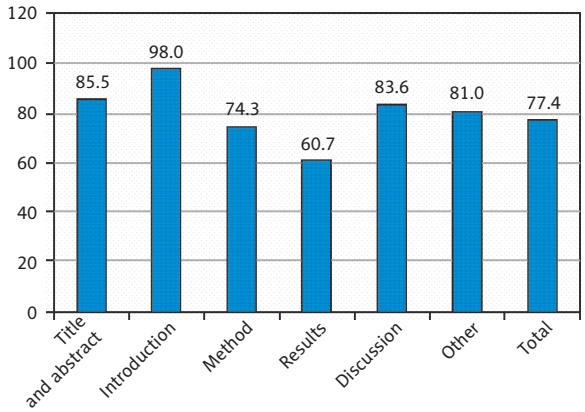


**Figure 2.** Compliance rate of published cross-sectional reports of studies on pregnancy decision-making in women with HIV/AIDS according to the STROBE statement

**Table 3.** Average quality scores of cross-sectional study reports reviewed based on the STROBE statement

| Section | Minimum–maximum tool score | Minimum–maximum earned score | Overall, *n* | Mean | SD |
|---|---|---|---|---|---|
| Title and abstract | 0-2 | 1-2 | 65 | 1.71 | 0.45 |
| Introduction | 0-3 | 2-3 | 112 | 2.94 | 0.22 |
| Method | 0-23 | 10-21 | 650 | 17.10 | 3.21 |
| Results | 0-13 | 3-11 | 300 | 7.89 | 1.81 |
| Discussion | 0-5 | 2-5 | 159 | 4.18 | 0.89 |
| Other information | 0-1 | 0-1 | 31 | 0.81 | 0.39 |
| Overall | 0-47 | 22-44 | 1,382 | 36.36 | 5.24 |

**Table 4.** Quality of published cross-sectional reports of studies on pregnancy decision-making in women with HIV/AIDS according to the STROBE statement

| No. | Author (year) [Ref.] | Title and abstract | Intro-duction | Methods | Results | Discussion | Other information | Overall | Quality |
|---|---|---|---|---|---|---|---|---|---|
| 1 | Kline *et al.* (1995) [25] | 1 | 3 | 21 | 7 | 4 | 1 | 37 | Good |
| 2 | Bedimo *et al.* (1998) [26] | 1 | 3 | 18 | 7 | 5 | 1 | 35 | Good |
| 3 | Smits *et al.* (1999) [27] | 1 | 3 | 10 | 5 | 4 | 1 | 26 | Moderate |
| 4 | Duggan *et al.* (1999) [28] | 2 | 3 | 12 | 6 | 5 | 0 | 28 | Moderate |
| 5 | Sowell *et al.* (1999) [29] | 2 | 3 | 10 | 4 | 4 | 1 | 24 | Moderate |
| 6 | Sowell *et al.* (2002) [30] | 1 | 3 | 15 | 9 | 2 | 1 | 31 | Moderate |
| 7 | Moyo and Mbizvo (2004) [31] | 2 | 3 | 16 | 7 | 3 | 1 | 32 | Good |
| 8 | Craft *et al.* (2007) [32] | 1 | 3 | 14 | 9 | 5 | 1 | 33 | Good |
| 9 | Stanwood *et al.* (2007) [33] | 1 | 3 | 17 | 10 | 4 | 1 | 36 | Good |
| 10 | Nóbrega *et al.* (2007) [34] | 2 | 3 | 16 | 6 | 5 | 1 | 32 | Good |
| 11 | MacPhail *et al.* (2007) [35] | 2 | 3 | 16 | 9 | 4 | 1 | 35 | Good |
| 12 | Fiore *et al.* (2008) [36] | 2 | 3 | 18 | 9 | 4 | 1 | 37 | Good |
| 13 | Maier *et al.* (2009) [37] | 2 | 3 | 19 | 9 | 4 | 1 | 38 | Good |
| 14 | Loutfy *et al.* (2009) [38] | 2 | 3 | 17 | 9 | 5 | 1 | 37 | Good |
| 15 | Finocchario-Kessler *et al.* (2010) [39] | 2 | 3 | 14 | 9 | 5 | 1 | 34 | Good |
| 16 | Kaida *et al.* (2011) [40] | 2 | 3 | 19 | 8 | 5 | 1 | 38 | Good |
| 17 | Cliffe *et al.* (2011) [41] | 1 | 3 | 15 | 6 | 5 | 1 | 31 | Moderate |
| 18 | Natalie *et al.* (2011) [42] | 1 | 3 | 16 | 11 | 5 | 0 | 36 | Good |
| 19 | Finocchario-Kessler *et al.* (2012) [43] | 2 | 3 | 16 | 9 | 5 | 1 | 36 | Good |
| 20 | Finger *et al.* (2012) [44] | 2 | 3 | 14 | 8 | 5 | 1 | 33 | Good |
| 21 | Moses and Dhar (2012) [45] | 2 | 3 | 10 | 5 | 3 | 0 | 23 | Moderate |
| 22 | Wagner *et al.* (2014) [46] | 1 | 3 | 18 | 9 | 5 | 0 | 36 | Good |
| 23 | Melaku and Zeleke (2014) [47] | 2 | 3 | 17 | 10 | 4 | 1 | 37 | Good |
| 24 | Asfaw and Gashe (2014) [48] | 2 | 3 | 15 | 10 | 5 | 1 | 36 | Good |
| 25 | Laryea *et al.* (2014) [49] | 2 | 3 | 10 | 7 | 4 | 1 | 27 | Moderate |
| 26 | Melka *et al.* (2014) [50] | 2 | 3 | 13 | 7 | 3 | 0 | 28 | Moderate |
| 27 | Laar *et al.* (2015) [51] | 1 | 3 | 16 | 8 | 4 | 1 | 33 | Good |
| 28 | Gyimah *et al.* (2015) [52] | 2 | 3 | 18 | 9 | 5 | 0 | 37 | Good |
| 29 | Litwin *et al.* (2015) [53] | 2 | 3 | 17 | 9 | 4 | 1 | 36 | Good |
| 30 | Rhodes *et al.* (2016) [18] | 1 | 3 | 10 | 8 | 5 | 1 | 28 | Moderate |
| 31 | Haddad *et al.* (2016) [54] | 2 | 3 | 13 | 7 | 5 | 1 | 31 | Moderate |
| 32 | Adler *et al.* (2017) [55] | 2 | 3 | 11 | 5 | 5 | 1 | 27 | Moderate |
| 33 | Ramos de Souza *et al.* (2017) [56] | 2 | 3 | 18 | 9 | 5 | 1 | 38 | Good |
| 34 | Mayhew *et al.* (2017) [57] | 2 | 3 | 16 | 8 | 4 | 1 | 34 | Good |
| 35 | Mekonnen and Minyihun (2019) [58] | 2 | 3 | 20 | 7 | 3 | 1 | 36 | Good |
| 36 | Shiferaw *et al.* (2019) [59] | 2 | 3 | 15 | 9 | 3 | 1 | 33 | Good |
| 37 | Hersey *et al.* (2019) [60] | 2 | 3 | 17 | 10 | 5 | 1 | 38 | Good |
| 38 | Arikawa *et al.* (2020) [61] | 2 | 3 | 15 | 10 | 3 | 1 | 34 | Good |

the STROBE statement to critically evaluate studies, because we could not find any similar articles on the subject. Using these suggested scores of STROBE, we could find variations in the quality of reporting based on the type of study. This could be seen as external validation [62].

The overall agreement rate between the reports of selected articles and the statements in the current study was 77.36%, which is comparable to the overall agreement rate with the studies of other authors who evaluated observational papers, as the agreement rate in these studies ranged from 30 to 85% [23, 63, 64]. In a study from 2013 that examined observational studies published in 4 European dermatology journals, the results indicated an average compliance of 57% in the range of 18-98% [63]. Another study related to oncology papers published between 2007 and 2008, reported a compliance rate as 70-97% [13]. The section with the highest compliance rate in the present study was the introduction section (98.85%). Also, Fang *et al*. [65] found that the areas with the highest percentage of compliance were title, introduction, and abstract. In their study, compliance rate evaluated with the STROBE criteria was 100% in the introduction section, and 86% and 93% in title and abstract, respectively. In Langan *et al*.'s research [14], the compliance rate was 97% for the introduction section, 87% for title, and 93% for abstract. To facilitate accurate indexing of the article in electronic databases, the research method should be included in the title. Indexing is essential in ensuring that a researcher's work is accessible to the public, increasing the possibility of citation in articles [66].

In the current study, the lowest compliance rate was for the results section of (60.69%), followed by method (74.34%), which is consistent with the results of Llorca *et al*.'s study [67].

The results section should provide a detailed explanation of the level of response and characteristics of the research population as well as the most important descriptive and analytical findings. Also, the type of observational design used by an investigator and statistical analysis performed, will determine the data presented [68].

Mentioning the eligibility criteria of participants (item 11) was not stated in only one study. A detailed description of the inclusion criteria of participants helps the readers better understand the applicability of results. Despite the importance of this item in a cross-sectional study that examined the quality assessment of longitudinal studies in research related to stroke, 17 articles out of 49 (35%) did not specify the eligibility criteria [6]. Another item on the STROBE checklist is the use of a flow diagram (item 31). In the present study, flow diagrams were drawn in only three cases. The results of a survey in 2017 showed that articles published in ENT (otolaryngology) journals used flow diagrams in only 7% of cases, but in articles published in general medical journals, this rate was 45% [69]. Estimates of the conversion of relative risk into absolute risk for a meaningful period were reported in any of the articles of the present study, which is similar to the research conducted in the field of ENT [69]. A 2006 study examining the abstracts of 222 articles published in medical journals, found that absolute risk measures were reported in 62% of clinical trial abstracts, but only in 21% of cohort abstracts [70].

In the present study, the confidence interval (item 36) was reported in 84.2% of the included articles. In a 2004 study investigating the reporting quality of epidemiological studies, it was shown that confidence intervals were reported in most of the papers [5]. The analysis of sub-groups (item 41) in the present study covered 81.6% of the cases; the report of the analysis of sub-groups allows to observe whether the effects or aggregations are different among the groups or not [71]. This amount was reported to be about 50% in Hendriksma's review [69], who evaluated observational studies published in the top 5 ENT journals. The discussion section shows the validity of the main topics of the study and its meaning [72], and in the present study, 83.6% of papers demonstrated a compliance with the statement. In the field of other information (item 47), 81.6% of the articles mentioned sources of funding. It should be noted that the report of this item depends on the format of the journal, thus some papers recommend declaring funding and conflicts of interest in the article format [73, 74]. Authors or funders may have conflicts of interest in certain areas, which has an impact on each of the following: study design [75], exposure selection [75], results [76], statistical methods [77], selective publication of results [76], and research design [78]. As a result, funders' roles should be explained in detail, so it is clear which parts of the study they were directly responsible for [73].

This study found no evidence confirming that the publication of the STROBE statement has significant effects on the quality of the published studies, which is in line with Fung *et al*. [65]. Two guidelines, CONSORT and PRISMA, were published before STROBE. Many medical journals supported the STROBE statement [1], whereas in several studies, the CONSORT and PRISMA statements resulted in an improvement in the quality of reports [79, 80]. Pandis *et al*. [81] and Hopewell *et al*. [82] concluded that the active endorsement and support of the CONSORT statement led to an improvement in the quality of reports. In general, the STROBE statement and other statements related to the research reports should consider guidelines, which need to be evaluated, modified, and, if necessary, changed according to experience and new evidence [83]. In this regard, two prominent commentators also argued that the STROBE statement should have an "expiry date" [84]. For the afore-mentioned reasons, since the publication of the STROBE checklist in 2007, it has been revised 13 times by the Enhancing the Quality and Transparency of Health Research Network (EQUATOR), which is an international collaboration aiming at improving the transparency and accuracy of guidelines [85]. The mandatory submission of completed STROBE, CONSORT, and PRISMA reporting guideline standards, along with paper submission, raised compliance with these guidelines from 13% for observational research to 58% for systematic reviews [86]. This study suggest the implementation of guidelines in online submission systems, which can be seen by both researchers and reviewers [86]. The simple approval of using reporting

criteria by a scientific journal had little-to-no impact on the quality of reporting [87].

This is the first study conducted to evaluate the quality of cross-sectional studies in the field of pregnancy decisions in women with HIV/AIDS. Another advantage of the study is that it included a time-free search and had a referee to settle disagreements between the two authors' assessments of the articles under review, which reduced bias in the process of determining the articles' level of quality. The main limitation is the lack of evaluation of other cross-sectional studies published in other languages in this field. It is suggested that additional research should be conducted using the STROBE tool to evaluate articles on the barriers and motivations to childbearing among HIV/AIDS-positive women. The results of this study can be useful for researchers to pay more attention to standards when writing the results section of cross-sectional studies.

## Conclusions

Considering that all of the included papers were published in journals of tier 1 indexes, the quality of the assessed articles was between moderate and good. The section with the highest compliance was the introduction, whereas the section with the lowest compliance was the results section. Given that clear and accurate article reporting allows medical researchers to not only accurately evaluate the validity of publications, but also supports healthcare providers with more confidence in the results obtained for use in practice, the authors of this study recommend that the STROBE statement should be used to evaluate medical science journal articles, and that researchers need to adhere strictly to standard principles when preparing and submitting scientific papers.

## Disclosures

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4. Conflicts of interest: None.

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