AIDS Research and Therapy

MATTERS ARISING

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A matters arising: a structural equation modeling approach to investigate HIV testing willingness for men who have sex with men

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Abstract

This is a Matters Arising about an article titled "A structural equation modeling approach to investigate HIV testing willingness for men who have sex with men in China" in the issue of AIDS Res Ther 20, 64 (2023) " of this journal has been published. While thanking and appreciating the good authors of this article, we would like to explain some of the methodological issues of this study in order to clarify and disambiguate the methodology part of this article and other articles submitted in this style. First of all, it should be known that the concept and definition of structural equation modeling, the reason and method of doing it, specifying the observable and latent variables in the model, the exogenous and endogenous variables of the model, the correct way to draw the SEM graph, should be properly considered. The authors of this Matters Arising do not seek to refute or confirm the authors of this article. Our final opinion is that the methodology section should be written better and scientific clarification should be made in the methodology section for readers and interested parties.

Purpose of the article

Clarifying the methodology for the mentioned article and other articles sent to this journal so that the readers and interested parties can better understand and apply the methodology content.

Keywords Matters arising, Structural equation modeling, HIV, MSM, HIV test, Methodology

This manuscript serves as a Matters Arising (MA) regarding the article titled "A Structural Equation Modeling (SEM) Approach to Investigate Human Immunodeficiency Virus (HIV) Testing Willingness for Men Who Have Sex with Men (MSM) in China," published in the journal AIDS Research and Therapy, Volume 20, Article 64 (2023).

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The authors initially attempted to communicate with the corresponding author, Xiaoni Zhong, via email but did not receive a response. Given the author's busy schedule and the impending publication of the next journal issue, it was imperative to proceed with writing this MA without delay. While we appreciate the contributions of the original authors, we aim to clarify certain methodological concerns present in the article.

First and foremost, it is essential to address the concept of SEM and its underlying model assumptions. A clear and precise SEM diagram is critical for readers to understand the relationships between variables [1, 2].

The original authors could have improved clarity in the Methods section by explicitly identifying which variables are directly measured and which are latent variables,

along with their definitions and data types. Furthermore, despite the lack of verification for SEM assumptions, the results section claims that these assumptions were satisfied [1–3].

The diagram presented in the original article lacks standardization; for instance, "perceived risk," which is identified as a primary factor influencing testing willingness, should be represented as a mediating variable in the diagram. A clearer distinction between endogenous and exogenous variables would enhance the reader's comprehension of the model [4, 5].

The current diagram primarily reflects initial theories derived from exploratory factor analysis (EFA) and does not align with standard SEM representations [2, 6–8].

Another significant issue is the representation of the knowledge variable, which is a latent variable. According to SEM guidelines, latent variables should be depicted as circles or ovals, similar to the representation of attitude and behavior variables. In contrast, observable variables should be represented as squares or rectangles. Incorrect graphical representation can lead to software errors during analysis [2, 3, 9, 10].

Additionally, it would have been beneficial to include observable variables for each latent variable in the SEM diagram. This inclusion would allow for the examination of covariance between variables and the regression weights of each question with other variables [9–12].

To illustrate these points, we propose a revised diagram of the model (Fig. 1) [13]. Also You can refer to the article published in this journal at the address " https://doi.org/10.1186/s12981-023-00565-5 " and see the SEM graph example.

Moreover, presenting model fit indices in a table with acceptable ranges would provide readers with a clearer understanding of the model's performance. SEM fit indices can be categorized into three groups: absolute fit, comparative fit, and parsimony fit. Therefore, it is advisable to report at least one index from each category [2, 3, 9, 10, 14].

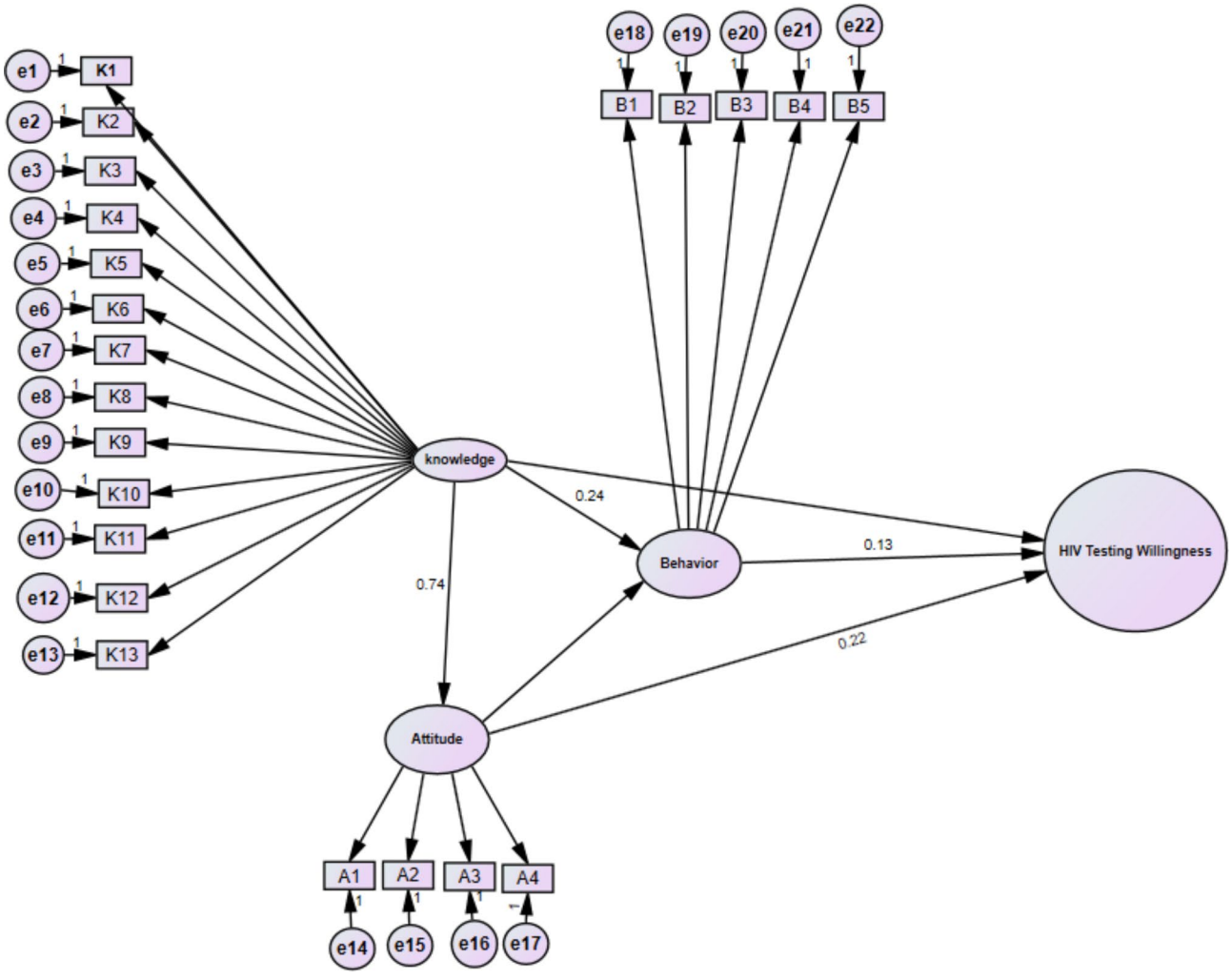

Fig. 1 Structural equation model. Hidden and observable variables of the model

A critical issue raised in the research is the reported X^2/df index of 4.2, which exceeds the acceptable limit of 3. Additionally, the P-value should have been reported; however, it was omitted, and the index was higher than acceptable. In such cases, it is essential to discuss the reasons for the unacceptable indices in the discussion Sects. [2, 5, 6, 9, 10].

Lastly, a more detailed explanation of the questionnaire used in the study would enhance clarity. This should include information about the authors, year of publication, measurement scale, response options (e.g., yes/no, 3-point Likert scale, 5-point Likert scale), and the psychometric indicators of validity and reliability [1–5, 10, 12].

Conclusion

The authors of this letter do not intend to reject or endorse the research presented in the original article. However, we believe that the methodology section requires significant improvement. We recommend that the authors provide additional scientific clarifications, including strengthening the methodological descriptions, clarifying the research stages, and utilizing fit indices with their acceptable values. These enhancements will enable readers and interested parties to gain a better understanding of the research methods employed in the study. By addressing these methodological concerns, the authors can improve the clarity and impact of their findings.

Abbreviations

MA	Matters Arising
HIV	Human Immunodeficiency Virus
MSM	Men who have Sex with Men
SEM	Structural Equation Modeling
EFA	Exploratory Factor Analysis

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Author contributions

A.J. drafted the manuscript. J.H. reviewed and revised. All authors have read and agreed to the published version of the manuscript.

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Data availability

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Declarations

Ethics approval and consent to participate

Not applicable.

Consent for publication

Not applicable.

Competing interests

The authors declare no competing interests.

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