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Willingness-to-pay for health insurance: A comparative study between formal and informal health-workers

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Funding: No specific funding was received for this work.

Potential competing interests: No potential competing interests to declare.

Abstract

Introduction

People in low- to middle-income countries, such as Bangladesh, have less access to healthcare than those in wealthier nations. In Bangladesh, households spend an average of Tk 103.46 billion (US \$1.49 billion) on out-of-pocket medical costs each year, which accounts for 64.3% of total health expenditures. The informal sector, which employs 85.1% of the total workforce, has limited or no health insurance (HI). Less than 1% of Bangladesh's population has access to social health protection, which is mostly limited to those who work in the formal sector (14.9% of all jobs). This comparative study will use the contingent valuation method to determine the willingness-to-pay (WTP) for health insurance and associated factors between formal and informal health workers.

Methods and analysis

This is the study protocol for a comparative study of the willingness-to-pay (WTP) for health insurance and associated factors between formal and informal health workers using the contingent valuation method (CVM), which will be conducted over a 12-month period, from September 2022 to September 2023. A total of 250 health workers will be selected by a convenience sampling technique from various formal and informal work stations in Dhaka City. Of the 250 participants, 125 will be from the formal sector and 125 will be from the informal sector. To collect data, a semi-structured questionnaire will be used via face-to-face interviews. Data will be processed and analyzed using R (version 4.3.0), RStudio (2023.03.1 Build 446). WTP for social health insurance will be estimated using the DCchoice package.

Ethics and dissemination

Ethical clearance was obtained from the Institutional Review Board (IRB) of the National Institute of Preventive and Social Medicine (NIPSOM) on December 29, 2022. The memo number is NIPSOM/IRB/2022/14 (1). Informed consent will be taken from each participant before data collection. Privacy and confidentiality of data will be maintained strictly. Participants will have full freedom to refuse to participate at any point in the study. The results of the study will be published in scientific, peer-reviewed journals.

Strengths and limitations of this study

1. The contingent valuation method is a well-established method of eliciting WTP for health insurance.
2. The current study will be among the first of its nature as it will focus on formal and informal healthcare workers.
3. Starting point bias may affect the result as this type of bias comes with the Double bounded dichotomous choice (DBDC) method used in this study.

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Introduction

Background

People in low- to middle-income countries (LMICs), such as Bangladesh, have less access to healthcare than those in wealthier nations. The lack of access to healthcare can be seen as part of a larger cycle in which poor health keeps people poor.^[1] A population's health is a key factor in poverty reduction, economic growth, and long-term economic development. A well-planned healthcare system protects the public from the financial risks associated with illness. Healthcare costs are increasing at a faster rate than ever before due to an aging population, an increase in the prevalence of chronic diseases, and the availability of more technologically advanced, expensive treatments. Out-of-pocket (OOP) payments make up a significant portion of how LMICs pay for their health systems.^[2]

About 800 million people worldwide spend more than 10% of their household income on health care, a financial burden that has left 100 million people extremely poor.^[3] Bangladesh has the highest rate of catastrophic expenditures in the Asia-Pacific region at 17% (7% of Bangladeshi households spend more than 10% of their income on health care), who are forced to borrow money or sell household assets to pay for illness-related costs.^[4] A study found that Bangladeshi households spent approximately Tk 103.46 billion (US \$1.49 billion) on out-of-pocket medical costs per year, accounting for 64.3% of total health expenditures.^[5] The average household spends 7.5% of its total income on health care, while the poorest 20% spend approximately 13.5%. These large out-of-pocket costs are both a burden and a barrier to getting health care.

All economic activity outside formal institutions makes up Bangladesh's informal sector. It employs 85.1% of the total workforce with limited to no health insurance. Less than 1% of Bangladesh's population, mostly those who work in the formal sector, have access to social health protection,^[6] which is 14.9% of all jobs.^[7]

Health insurance facilitates the transfer of funds from a healthy state to an ill state in order to cover medical expenses. As a result, health insurance makes health services more affordable, increases access and use of healthcare, and mitigates the financial consequences of poor health.^[8] The Willingness-to-pay is considered as the most a person is willing to pay for a product or service. WTP can be estimated using various methods. One such method is the Contingent Valuation Method (CVM). In this method, Individual preferences are determined by asking about WTP for public goods and services while prices are unavailable. According to some health economists, WTP is the best approach to developing health insurance schemes.^[9]

Out-of-pocket (OOP) payments continue to be the primary source of funding for healthcare in Bangladesh. A recent study found that around 25% of people had catastrophic health expenditures (CHE), while 14% of the population ignored treatment for any reason. The most common reason for forgoing healthcare was the cost of treatment (17%).^[10] Bangladesh has a goal of achieving universal health care coverage. Despite making great strides in public health during the past two decades, the country still lags behind countries like China, Vietnam, Thailand, etc. in achieving Universal Health Coverage. The World Health Organization (WHO) has stated that health insurance is crucial to achieving universal health coverage.^[11]

The majority of the population (85.1%) of Bangladesh depends on work in the informal sector. However, the informal sector is fragile and segmented. Each segment of the informal economy has similar but unique needs. Low, irregular, and unstable employment, as well as a lack of fair credit, frequently lead to a financial crisis among informal workers. In Bangladesh, the number of people who have got some sort of social health protection coverage is less than 1%.

The promotion of health insurance coverage to formal and informal workers should begin with a sound understanding of their WTP and the factors affecting it. Very few studies compare WTP for health insurance between formal and informal health-workers. This study will determine the WTP for health insurance and associated factors between formal and informal health workers of Bangladesh using the contingent valuation method (CVM).

Conceptual framework

Figure 1 depicts the conceptual framework of the current study.

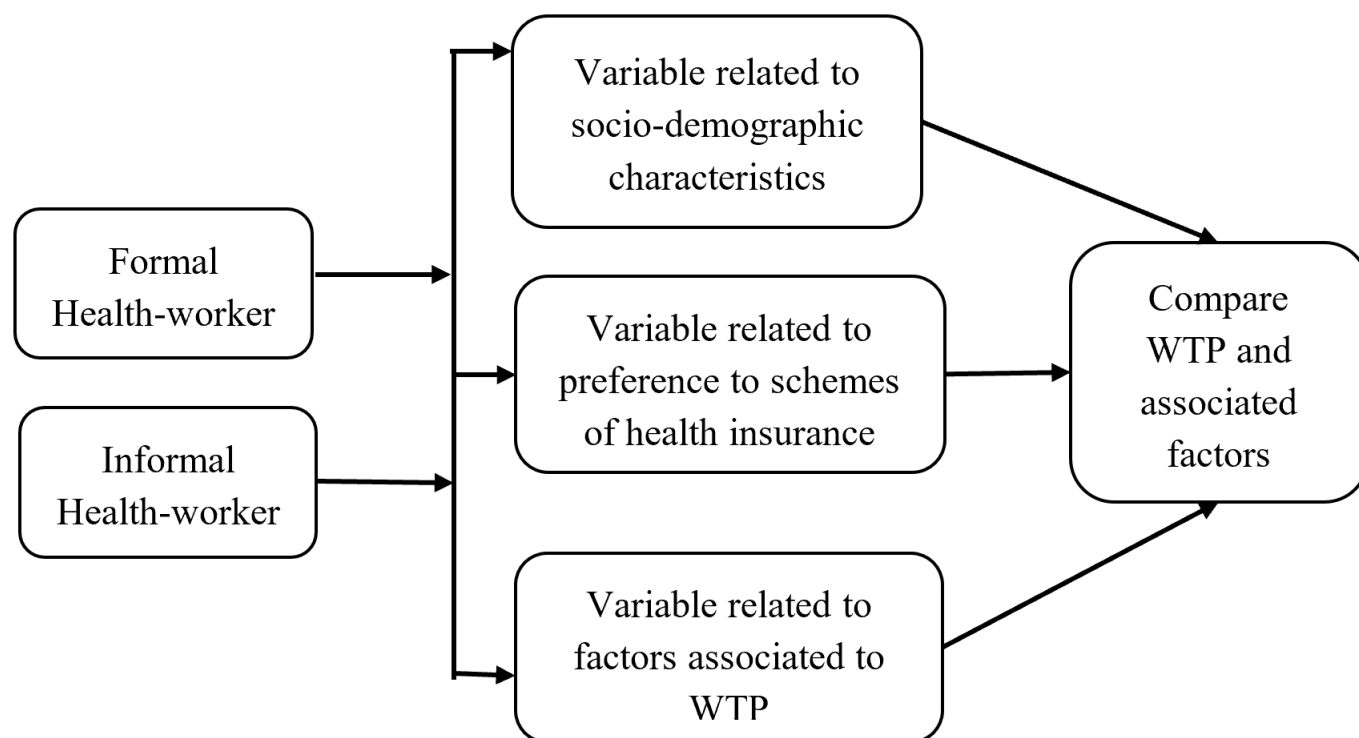


Figure 1. Conceptual framework for a comparative study between the WTP for health insurance among formal and informal health-workers

Methods and Analysis

Aims and Objectives

The following study aims to estimate the Willingness-to-pay for health insurance of formal health-workers differs from informal health-workers and compare. The objective of the study is:

- To compare the WTP for health insurance between formal and informal health-workers.
- To compare preference to schemes of health insurance between formal and informal health-workers.
- To compare factors associated with WTP for health insurance among formal and informal health-workers.
- To compare the socio-demographic characteristics of the formal health-workers and the informal health-workers.

Operational Definitions

Catastrophic health expenditure: It is a situation where after meeting subsistence needs i.e. food, a household spends over 40% of its income on health care.

Health-workers: A healthcare worker is an individual who provides care and services to the sick and ailing, either directly as physicians and nurses or indirectly as aides, laboratory technicians etc.^[12] In the current study, health workers with at least 6 months of experience will be considered.

Primary job: In this study, primary job will be defined as the job in which the longest hours are usually worked. Only the

status of the primary job will be considered in determining whether the participant is a formal or an informal worker.

Formal workers: Formal employees are hired by a company in accordance with an established employment contract.^[13] In this study, we will consider all those health workers who receive compensation, health benefits, and set work hours. For example, health workers who are working at various establishments as fixed-term or permanent, and contractual (at least 1 year) employees.

Informal workers: It refers to workers whose jobs don't offer basic social or legal protections or employment benefits. In this study, we will consider those health workers as informal workers who do not receive compensation, health benefits and set work hours and who don't receive an established employment contract or have a contract of <1 year. Examples include: Employees hired on a day-to-day basis, doctors and nurses working in private chambers, etc.

Contingent Valuation Method: Contingent valuation is a survey technique used to determine the highest WTP for a product. The respondent is first provided with a description of the product and a fictitious market where it can be purchased (the contingency). The respondent is then asked to specify the highest price at which they would be willing to purchase the item (the valuation).^[14] CVM employs the Double bounded dichotomous choice (DBDC) as one of its elicitation procedures. The participant in DBDC responds "yes" or "no" to a stated amount and is then asked to respond "yes" or "no" to higher or lower bids (usually to a double or a half amount, respectively).

Health insurance schemes: In this study, 3 schemes will be considered:

- *Scenario A—No insurance (out-of-pocket model):* In this scenario, the participant will pay the full cost for each visit to health institutions and for the medicine prescribed to the individual and the individual's family members. A service is given at cost price. This means that the participant will be responsible for the entire cost of care, including the doctor's visit, the hospital stay, and any medications. If the participant is not able to pay, he or she will not receive any service.
- *Scenario B—Compulsory health insurance:* In this scenario, all participants are required to pay a monthly premium to a health care fund. The premium is based on a specified percentage of their monthly salary, which is determined by the government (or appointed authority). The employees' spouse and family members under the age of 18 are entitled to free health care at a nearby health center (determined by authority) and free medicine if prescribed by a doctor. The fund will be managed through an independent health care fund. If care at a higher level is needed, the insured patient will be supported and entitled to free health services in these facilities. This means that the patient will not have to pay anything out of pocket for their care.
- *Scenario C—Voluntary health insurance:* In this scenario, individuals can choose to voluntarily pay a monthly premium to an insurance organization. The premium is based on the number of beneficiaries in the household and the number of health facility visits and decided by the insurance organization. All persons in the household paying the fee are entitled to free health care at a nearby health facility and free medicine if prescribed by a doctor. If care at a higher level is needed, the insured patient will be supported by an amount based on the cost per day at the nearby health center.

Study Design

This comparative cross-sectional study of the WTP for health insurance and associated factors between formal and informal health workers using the contingent valuation method (CVM). Only a quantitative approach will be used.

Study Duration and Period

The study will be conducted from September 2022 to September 2023. The following activities will be conducted during this period:

- Preparatory activities: These activities will include developing the research protocol and instruments, and obtaining ethical approval.
- Protocol and research instrument development: This will involve creating a detailed plan for the study and developing the tools that will be used to collect data.
- Pretesting: This will involve testing the research instruments with a small group of people to ensure that they are clear and easy to use.
- Data collection: This will involve collecting data from the study participants using the research instruments.
- Data processing and analysis: This will involve entering the data into a computer and analyzing it using statistical software.
- Quality control check: This will involve checking the data for errors and ensuring that the analysis is accurate.
- Report writing: This will involve writing a report that summarizes the findings of the study.

Study Place

The study will be conducted at various formal and informal work stations in Dhaka City, including medical colleges, hospitals, private institutions, and research organizations.

Study Population

Formal and informal health-workers working at various formal and informal work stations of Dhaka city:

Selection Criteria

Selection Criteria for Formal Health-worker

Inclusion Criteria

- Formal health-workers working as fixed-term or permanent employees.
- Formal health-workers will be enrolled irrespective of sex.
- Formal health-workers who will provide informed written consent will only be included in the study.

Exclusion Criteria

- Years in service < 1 years.
- Formal health-workers who are unwilling to participate in the study.

Selection Criteria for Informal Health-worker

Inclusion Criteria

- Informal health-workers who haven't received an established employment contract or have a contract of < 1 year.
- Informal health-workers will be enrolled irrespective of sex.
- Informal health-workers who will provide informed written consent will only be included in the study.

Exclusion Criteria

- Years in service < 1 years.
- Informal health-workers who are unwilling to participate in the study.

Sample Size

The sample size has been determined by using the following formula:^[15]

$$\text{Sample size, } n = \frac{(Z_{\alpha/2} + Z_{\beta})^2 \times [\{P_1(1 - P_1)\} + \{P_2(1 - P_2)\}]^2}{(P_2 - P_1)^2}$$

Where:

n = sample size for each group

$Z_{\alpha/2}$ = the Z-value for the level of confidence (in this case, 1.96)

Z_{β} = the Z-value for the power (in this case, 0.84)

P_1 = prevalence of the first group (in this case, 0.83^[11])

P_2 = prevalence of the second group (in this case, 0.68^[16])

$$\text{So, sample size, } n = \frac{(1.96 + 0.84)^2 \times \{(0.83 \times 0.17) + (0.68 \times 0.32)\}}{(0.83 - 0.68)^2} = 124.987 \approx 125.$$

So, the sample in each group (formal and informal workers) would be 125.

Sampling Technique

As no sample frame is available, the study will use a convenience sampling technique to enroll the participants.

Data Collection Instruments

A pre-tested semi-structured questionnaire will be used for data collection.

Data collection technique

Face-to-face interviews will be conducted for data collection with the help of a semi-structured questionnaire.

Pre-testing

The data collection instrument was pre-tested among 26 participants (both formal and informal) who work in hospitals and chambers in Dhaka City. According to the findings of pre-testing, necessary modifications will be done to the questionnaire.

Data Processing

Collected data will be checked and verified thoroughly to reduce inconsistency. Data will be coded, categorized cleaned and entered into software. Quality of data will be ensured. Collected data will be transferred to the master table as per specific objectives and key variables.

Data analysis

Data will be edited and analyzed according to the objectives and variables by R (R version 4.3.0)^[17] RStudio (2023.03.1 Build 446) using `jmv`^[18] and `DCchoice` packages.^[19]

There will be two types of analysis: Descriptive statistics like frequency distribution, mean, median, mode, range, standard deviation etc. will be calculated by the SPSS program. For inferential statistics, a Chi-square test and independent t-test will be done to find out the association between categorical variables. Logistic regression models will be developed with all significant variables identified by chi-square tests. The discrete choice analysis will be conducted using the `DCchoice` package. Data will be presented in the form of tables, graphs and charts etc. as per requirement.

The current study will apply the DBDC model to estimate the WTP of the formal and informal health-workers. In the DBDC model, the participants will be offered an initial bid (b^i) to estimate the WTP for the compulsory health insurance package as a percentage of the participants' gross monthly salary. In case of a positive answer, participants are presented with a second bid (b^h) which will be double the initial bid. On the other hand, in case of a negative answer, participants will be offered a second bid (b^l) which will be half of the initial bid. Hence, there can be a total of four possible outcomes (also shown in Figure 02):

1. Yes-yes, implying that the participant is willing to accept higher bid prices. Hence, the $WTP > b^h$.
2. Yes-no, implying that the participant is willing to accept the initial bid price but not the doubled amount. Hence, the $b^i > WTP > b^h$.
3. No-yes, implying that the participant is not willing to accept the initial bid price but the amount if halved. Hence, the $b^i < WTP > b^l$.

4. No-no, implying that the participant is not willing to accept the initial bid price as well as the amount if halved. Hence, the $b^t < b^l < WTP$.

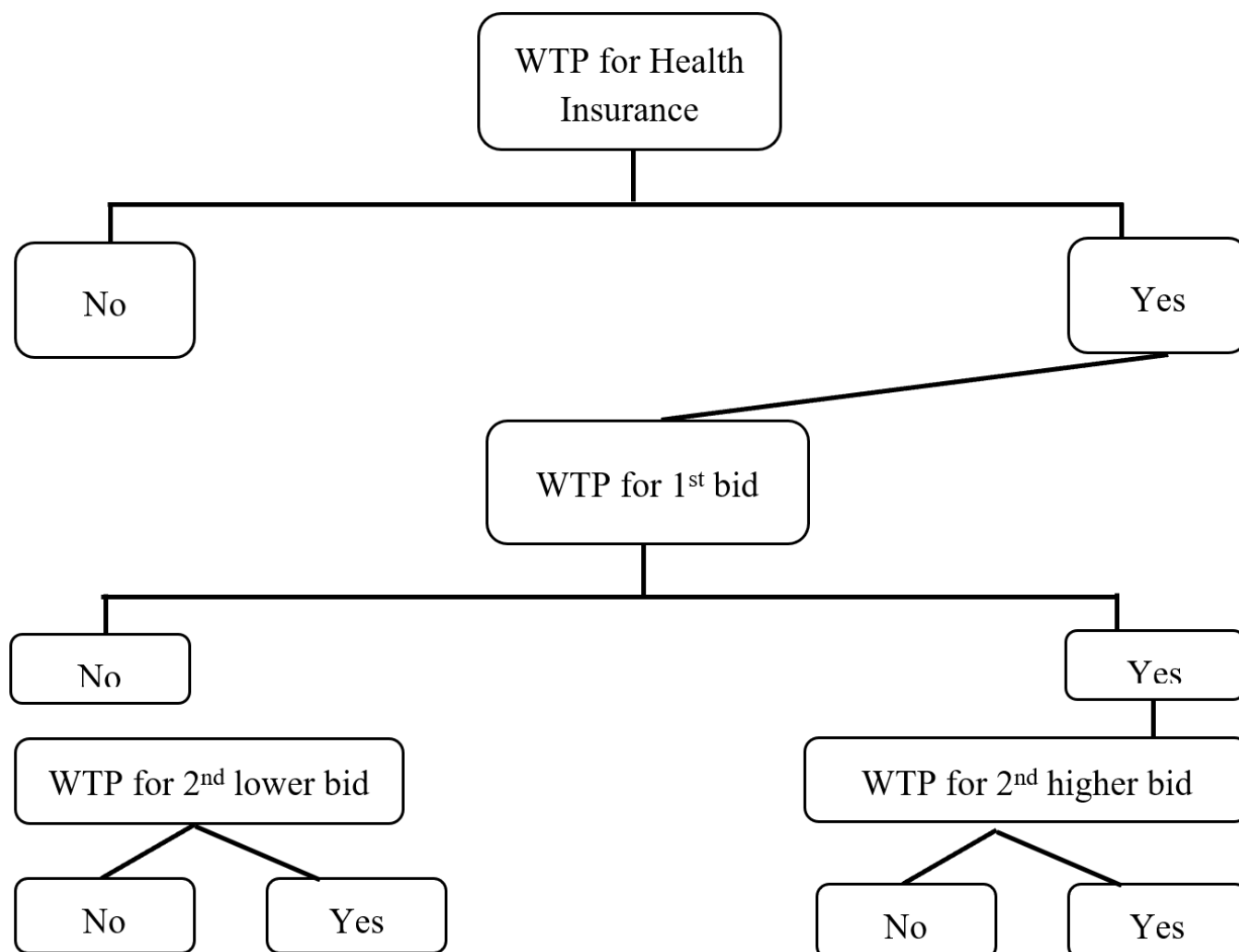


Figure 2. Summary of answers in the DBDC method

Using data from pre-testing, 4 initial bids were selected: 6%, 4%, 2% and 1%. To minimize the starting point bias, we will use the `RANDBETWEEN(1,250)` command of Microsoft Excel to randomize participants based on the participant's id into 4 unequal groups (the last two groups respectively will have one fewer participant) to select the starting bid.

Discussion

Health insurance

Health insurance is widely recognized as the most effective means to achieve universal health coverage (UHC). Unfortunately, in many low- and middle-income countries (LMICs), out-of-pocket (OOP) payments are one of the major

sources of funding for healthcare, amounting to almost 40% in some cases.^[20] This situation poses substantial challenges to ensuring that healthcare services are accessible and affordable for all. In low- and middle-income countries, individuals often have to pay for their own healthcare at the point of delivery. This can be a major barrier to accessing essential medical care, especially for people with limited financial resources. The need to pay out-of-pocket can force individuals and families to make difficult choices, such as prioritizing medical treatment over food, shelter, or education. However, Health insurance provides peace of mind and improved health. Health insurance typically covers a wide range of medical services, including preventive care, primary healthcare, specialized treatments, hospitalizations, and medications. This comprehensive coverage can help to promote early detection and management of health conditions, which can lead to improved health outcomes for the population at large. Furthermore, health insurance plays a crucial role in facilitating timely access to healthcare. By removing financial barriers, individuals are more likely to seek medical attention promptly, preventing the exacerbation of illnesses and reducing the need for expensive treatments in the future.

The CVM

The contingent valuation method (CVM) is a survey-based method that is used to elicit people's willingness to pay (WTP) for a good or service that is not currently available. The CVM has been extensively used in public decision-making in recent years, including in the field of health economics and health insurance. The CVM was first developed in the 1970s, and it has been used to assess the WTP for a wide range of goods and services, including environmental amenities, public goods, and healthcare. The CVM has several advantages over other methods of eliciting WTP, such as the fact that it can be used to value goods and services that are not currently available.

In recent years, there has been a trend towards using the double-bounded dichotomous choice (DBDC) approach to the CVM. The DBDC approach is a more robust method than the traditional CVM, and it has several advantages, including: higher response rates, more realistic than other traditional methods, lower likelihood of strategic biases, less opportunity for starting-point bias,^[21] and statistical efficiency.^{[22][23]}

Limitations of the study

The study also has some limitations. Results elicited using the CVM method may be affected by bias, especially starting-point bias.^[24] A second limitation is related to the health literacy rate. In Bangladesh, around 0.5% of people are covered by health insurance.^[25] As such, responses may not indicate the actual scenario. As a comparative cross-sectional design will be used, further research will be necessary to determine the process of change from willingness to pay to actually enrolling in health insurance.

Possible Policy implications

The current study will estimate and compare the willingness-to-pay (WTP) for health insurance among formal and informal health workers, as well as the associated factors. The findings can then be used to determine the necessary steps required to promote HI in Bangladesh and to help policy makers consider expanding the scope of coverage offered by

health insurance plans to include more preventive and chronic care services.

Funding statement

This research received no specific grant from any funding agency in the public, commercial or not-for-profit sectors.

Competing interests' statement

None

Declaration of AI usage

The author used ChatGPT (version 3.5) during the preparation of this work to enhance the language and readability of the manuscript, as the author is not native English speakers. After utilizing the tool, the author thoroughly reviewed and edited the content as necessary and assume full responsibility for the manuscript's content.

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