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Investigation for Preliminary Assessment of Lifestyle Influence and Socioeconomic Determinants in Cardiovascular Health and Disease Risks, in Fategarh Sahib District, Punjab, India

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Abstract

This pilot study investigates the lifestyle influence and socioeconomic determinant on cardiovascular health and disease exposure risk, in Fatehgarh Sahib District Punjab, India, with a focus on assessing the likelihood of a larger study or investigative initiative. Refining data collection methods, estimating sample sizes, and addressing ethical concerns were the key objectives included in this study.

Twenty (20) participants from four tehsils (Amloh, Bassi Patha, Ftehgarh Sahib and Khamanon), in Fatehgarh Sahib District Punjab State were recruited through convenient sampling, and data was collected in two phases via a Google Form questionnaire distributed through WhatsApp contacts.

The study assessed participants' knowledge and insight of lifestyle influence and socioeconomic impacts on cardiovascular health in the region under study. Using Cronbach's alpha and Pearson correlation coefficients, internal consistency and test-retest reliability were calculated respectively, in order to test the methodology and other instrument for the main study. Most measures demonstrated well to excellent reliability, particularly in test-retest reliability, suggesting high stability and consistency over time. Nevertheless, the internal consistency for "Indicators that Determine Cardiovascular Health (CVH**)**" was moderately low, indicating the need for refinement in that area.

The study successfully identified the viability or feasibility of the research methodology and highlighted the reliability of the instruments, setting a strong basis for the actual study. Slight methodological changes, particularly in cardiovascular health indicators, are recommended to ensure sturdiness.

Keywords: Cardiovascular Health, Lifestyle Influence, Socioeconomic Status, Cronbach's Alpha, Pearson Correlation Coefficients

Introduction

Cardiovascular diseases (CVDs) remain the leading cause of mortality globally, with India of no exception. Cardiovascular health is significantly influenced by interplay of lifestyle factors - such as diet, physical activity, and tobacco use - and socioeconomic determinants like income, education, and occupation. In Punjab's Fatehgarh Sahib District, traditional lifestyle practices intersect with contemporary health challenges, creating a unique context for understanding cardiovascular health trends. This pilot study therefore, seeks to preliminarily examine the impacts of lifestyle influence and socioeconomic status on

cardiovascular health in Fatehgarh Sahib District, Punjab, India, and prepare for a larger investigation by assessing the feasibility, estimating resources, and refining methodologies, needed for a full-scale research (***National Health Systems Resource Centre, 2021: Government of Punjab Statistical Data on Health Indicators in the Region***).

Objective

The primary objective of this pilot study is to investigate the influence of lifestyle choices and socioeconomic determinants on cardiovascular health and the risk of cardiovascular diseases in the Fatehgarh Sahib district. This study aims to establish a baseline understanding that will inform a larger, more comprehensive study.

Therefore, the primary objectives of this pilot study were to:

1. Examine the feasibility and reliability of the planned research methodology.
2. Improve the viability and consistency of data collection measures or procedures.
3. Approximate the essential sample size for a larger research.
4. Estimate the financial resources and the time required for the study.
5. Prepare/practice and upgrade or refine study protocols/procedures.
6. Recognize possible or potential challenges.
7. Refine research hypotheses and objectives.
8. Address ethical issues related to participant involvement.
9. Provide foundational data for future research

Methodology

A cross-sectional pilot study was conducted to gather preliminary data on lifestyle factors and socioeconomic determinants related to cardiovascular health.

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Study Design:

This study is framed as a **pilot study** with the primary objective of testing research methodologies in a real-world setting. Specifically, data were collected using **electronic Google Form questionnaires**, which were distributed through **WhatsApp** to the participants. The emphasis of the research is on **Lifestyle influence and socioeconomic determinants on cardiovascular health and Disease Risks**, and the respondents were from across **Fatehgarh Sahib District**, **Punjab, India**. The study also incorporated a **two-phase of data collection process**, where phase two took place **one month after** the initial phase of data collection.

Recruitment and Participation

The researcher randomly recruited twenty (20) participants across the residence of Fategarh Sarhib District of Punjab, with most responses obtained from Amloh and Fategarh Sahib. Convenient sampling technique was used to select the respondents for this study.

Data collection was conducted in dual segments. The sample size was concise, in line with the pilot study nature, safeguarding focused recruitment in arrears seen with more evidences of the hearth health issues relating to lifestyle activities. This two-phase approach likely provided an opportunity to assess changes over time or reinforce data integrity.

The process included meeting different personalities, and establishing friendly conversations, followed by self-introduction; then the purpose or aim of establishing this connection. This led to the exchange of email IDs and WhatsApp contacts, which were eventually used to send survey questionnaires to them through an electronic Google Form.

The questionnaires consisted of five (5) sections (**A, B, C, D, and E**,).

Section A: contained the **Demographic Information of the participants**.

This section collects personal details/data on the respondents, such as age, gender, occupation, religion, location, and educational background.

Section B: consisted of **Lifestyle Influence on Cardiovascular Health**.

Assesses the lifestyle choices such as physical activities like exercise, diet type and timing, sedentary

practices, smoking, alcohol intake and stress management; and how all can influence cardiovascular health.

Section C: contained **Indicators that Determine Cardiovascular Health (CVH)**

This section examines the parameter of indicators such as weight, cholesterol level, blood pressure level, sugar level, height, body mass index (BMI); and it impact on cardiovascular health

Section D: consisted **socioeconomic status or determinants on CVH risk**.

This segment gathers information on participants' awareness of the impact of socioeconomic status, such as income, educational level, and occupation; and how these status impact cardiovascular health.

Section E: comprised of **Community and Public Health impacts on CVH**

This section collects data about their knowledge or awareness on the availability or accessibility of facilities such as clinics, gym, health care programs, and supportive institutions that promote heart health.

This comprehensive survey design ensures that various dimensions of lifestyle influence and socioeconomic status, from risk exposure to the effect and how it should be controlled, are thoroughly examine. The electronic format and WhatsApp distribution produce a practical, accessible approach to gathering data in a geographically specific and context-sensitive setting.

The researcher clearly explained the purpose of the study to the participants/respondents. Following the first phase of data collection, the second segment took place after couple of weeks later, using the same respondents and the same questionnaires.

Data Analysis

Reliability Assessment:

To ensure the reliability of the scales used in the study, two key statistical methods were employed; namely: Cronbach's alpha and the Pearson correlation coefficient.

Internal Consistency (Cronbach's Alpha):

Cronbach's alpha is a statistical measure used to assess the internal consistency or coherence of a set of items (or questions) in a survey or tests that are supposed to measure the same construct.

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Thus, to assess the reliability of the selected scales, we conducted internal consistency and test-retest reliability tests. The Pearson correlation coefficient was used to measure these reliabilities. Internal consistency measures how well different items on a scale correlate to assess a single concept. This is quantified by Cronbach's alpha, which ranges from **0 to 1**. Values below **0.6** indicate poor internal consistency, while values from **0.7** upwards indicate good to excellent consistency (**Taber, 2018**).

Hence, in this study, Cronbach's alpha was used to assess the internal consistency of the survey scales, ensuring that the different items under each section of the questionnaire (such as awareness Lifestyle influence and SES) were reliably measuring their respective constructs

Test-Retest Reliability (Pearson Correlation Coefficient):

Test-retest reliability evaluates the stability of the measurements over time by comparing responses from the same participants at two different time points.

The **Pearson correlation coefficient** was used for this purpose. This coefficient measures the **strength** and **direction** of the linear relationship between two sets of data. In the context of this pilot study, it assesses whether the responses given by participants in the first phase of data collection are **consistent** with the responses they provided in the second phase (one month later).

High Pearson correlation values (close to +1) indicate that the participants' responses remained stable over time, suggesting the scale is reliable.

Lower correlation values (closer to 0 or negative) suggest a lack of consistency in participants' responses, potentially indicating issues with the scale's reliability over time.

In summary, **Cronbach's alpha** measured the internal consistency of the survey items, ensuring that each section reliably assessed its respective focus, while the **Pearson correlation coefficient** assessed the stability of responses over time, ensuring that the scales produced consistent results during the two phases of data collection.

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Results

In the table below, are the results from the variables tested during the pilot phase of the study:

Number of Questions	Variables/Measures	Internal consistency	Test-Retest Reliability
6 items	SES Determinants on CVH Risk	0.807	0.995
19 items	Lifestyle Influence on Cardiovascular Health (CVH)	0.812	0.994
18 items	Indicators that Determine Cardiovascular Health (CVH)	0.604	0.988
9 items	Community & Public Health Impacts On CVH	0.738	0.970

Discussion:

The pilot study on Investigation of Lifestyle Influence and Socioeconomic Determinants in Cardiovascular Health and Disease Risks reveals a strong association between lifestyle choices, socioeconomic determinants, and cardiovascular health risks in the Fatehgarh Sahib district. It demonstrated varying degree of internal consistency and reliability across difference variables under study. This means that lifestyle choices, socioeconomic status, other health indicators and the community have great influence in exposing an individual to cardiovascular health risks; depending on an individual adoption. Here now is the details discussion of each variable that was studied:

1. Socioeconomic Status (SES) Determinants on CVH Risk

Internal Consistency Score (0.807):

An internal consistency score of **0.826** according to **Cronbach's alpha,** indicates a high level of reliability; which indicates good and acceptable internal consistency. A score of **0.8** or above is generally considered good or dependable, suggesting that the scale is reliable for research purposes based on the fact that the items included in the measure of Socioeconomic Status Determinants on Cardiovascular Health Risk (SES-DCVHR) are well-correlated and reliably capturing aspects of SES and are consistent with one another. Meaning that, the various components (e.g., income level, education level, occupation) work well together to represent the concept of socioeconomic status.

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Cohesion of Items:

This score implies that the questionnaire or scale items measuring socioeconomic status are adequately related to each other and represent the same underlying construct.

Test-Retest Score (0.995):

Test-retest indicates very high stability over time. A test-retest reliability score of **0.995** suggests almost perfect stability over time. This means that when the same individuals complete the SES-DCVHR measure at different points in time, their responses remain virtually unchanged.

Meaning that, the components used to measure by this variable Socioeconomic Status Determinants on Cardiovascular Health Risk (SES-DCVHR) are reliable and correlate well with one another. This suggests that the measure of "Socioeconomic Status Determinants on Cardiovascular Health Risk" produces nearly identical results when administered at different points in time.

Overall Interpretation:

The combination of a high internal consistency score and near-perfect test-retest score indicates that the "socioeconomic status determinants on cardiovascular health risk" variable is a reliable measure. It suggests that the questionnaire or scale items designed to capture SES- DCVHR are well-constructed and that the tool provides consistent results across time. This high reliability is critical for accurately assessing and interpreting the impact of socioeconomic status on health outcomes, such as cardiovascular disease risk.

2. Lifestyle Influence on Cardiovascular Health (CVH)

Internal Consistency Score (0.812):

According to Cronbach's alpha, an internal consistency score of **0.812** indicates good internal consistency**.** A score above 0.8 is considered good, meaning that the items related to "lifestyle influence on cardiovascular health" are highly correlated with one another. This means that the items or the questions designed to measure lifestyle influence on cardiovascular health are well-correlated and reliable in measuring the same underlying construct or factor.

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Test-Retest Score (0.994):

Test-retest reliability measures the stability of a test over time. It is calculated by administering the same test to the same participants on two different occasions and then correlating the scores.

Thus, after couple of weeks, a reliability coefficient of **0.994** was obtained. A test-retest reliability value of **0.994** indicates very high stability or almost perfect consistency over time. The test results are extremely consistent.

This means that the measure of "lifestyle influence on cardiovascular health" produces nearly identical result; which shows that the test is a very precise tool for measuring results when administered at different times, or results over repeated administrations.

Overall Interpretation:

The combination of high internal consistency and a perfect test-retest score indicates that the "lifestyle influence on cardiovascular health" variable is a reliable and stable measure.

It reliably captures information about lifestyle factors affecting cardiovascular health and is consistent in its measurement across different instances. This high reliability is essential for drawing accurate conclusions about the role of lifestyle factors in cardiovascular health and related outcomes.

3. Indicators that Determine Cardiovascular Health (CVH)

Internal Consistency Score (0.604):

An internal consistency score of 0.604 indicates moderate internal consistency. This means that the items or components used to measure "Indicators that Determine Cardiovascular Health" are reasonably correlated with each other, but there is room for it to be refined or improved for better reliability

Test-Retest Score (0.988):

A value of **0.988** is very high, indicating that the test is extremely reliable over time. This means that respondents tend to get almost the same score when the test is repeated, which is ideal for a stable measurement tool.

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This implies that the measure of "Indicators **that Determine** Cardiovascular Health" is extremely reliable and consistent over time, making it a very stable variable. It indicates that the measure is very stable over time and produces consistent results when repeated.

Overall Interpretation:

The high test-retest reliability (**0.988**) suggests that the tool is stable over time, but the moderate internal consistency (**0.604**) indicates that some items within the tool may need refinement to ensure they consistently measure the same construct.

4. Community & Public Health Impacts On CVH:

Internal Consistency Score (0.738):

A Cronbach's alpha value of **0.738** indicates acceptable internal consistency. In general, a value above **0.7** is considered good for research purposes, implying that the items on the test are sufficiently correlated and measure the same concept or hypothesis.

It suggests that the items work together reasonably well, though they still allow for some variability, which is often useful in avoiding redundancy.

Test-Retest Score (0.970):

A test-retest reliability value of **0.970** is excellent, indicating that the test produces very consistent results when administered to the same group at different times. A high test-retest reliability suggests that the tool is very stable, meaning it measures the same construct reliably over time, indicating that it consistently produces the same results, even if the items themselves may not be perfectly aligned.

Overall Interpretation:

Internal consistency (0.708) suggests that the items on the measurement tool are acceptably related and provide a coherent measure of the intended construct. Test-retest reliability **(0.970)** shows that the tool is highly stable over time, meaning it consistently produces similar results when used at different times with the same respondents. Together, these values indicate that the tool is reliable, with strong temporal stability, and has acceptable internal item consistency. While the internal consistency is good, further refinements

could enhance it.

Study Limitations

Sample Size:

The small sample size limits the generalizability of the findings. The pilot study serves as a preliminary exploration rather than a definitive analysis.

Self-Reported Data:

Reliance on self-reported data may introduce bias, particularly in the reporting of sensitive behaviors like tobacco and alcohol use.

Implications for Future Research:

The findings underscore the need for a larger-scale study to further explore these associations and to develop effective interventions. Future research should consider a more extensive sample size, longitudinal data collection, and more detailed assessments of dietary intake and physical activity

Conclusion

This pilot study offers preliminary insights into the lifestyle and socioeconomic factors affecting cardiovascular health in Fatehgarh Sahib District, successfully demonstrating the feasibility of the research methods and highlighting areas for refinement. Most measures showed good to excellent reliability, indicating that the instruments are robust for the main study.

However, the moderate internal consistency in the Indicators that Determine Cardiovascular Health section suggests that revisions are necessary.

The high test-retest reliability across all sections confirms the stability and consistency of the data collection methods over time. This pilot study lays a solid foundation for the main study by addressing methodological issues, ensuring proper resource allocation, and adhering to ethical standards. The results highlight the need for comprehensive public health strategies to promote healthier lifestyle choices, particularly among lower socioeconomic groups. These findings will guide the development of a larger study to tackle the rising burden of cardiovascular diseases in the region.

Recommendations:

- Refine the "Indicators that Determine Cardiovascular Health (CVH)" section to improve internal consistency.
- Implement educational programs within communities to raise awareness about preventing cardiovascular disease (CVD) and encourage healthy lifestyle habits.
- Develop policies to enhance residents' socioeconomic well-being through vocational training, financial literacy, and educational opportunities.
- Expand the sample size to increase the statistical power of the main study.
- Promote awareness of traditional, nutrient-rich diets and correct misconceptions about healthy eating.
- Encourage employers to offer wellness programs that support physical activity, mental health, and stress management.
- Conduct further research on efforts to mitigate lifestyle and socioeconomic factors that impedes cardiovascular health.
- Increase access to preventive healthcare by setting up primary centers for routine screenings and early heart health interventions.

Conflict of Interest Statement

I the author and the co- authors of this study declare no contending or competing conflict of interests related to this paper title: “Investigation for Preliminary Assessment of Lifestyle Influence and Socioeconomic Determinants in Cardiovascular Health and Disease Risks, in Fatehgarh Sahib District, Punjab, India.

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