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DEVELOPMENT OF AN EVIDENCE-BASED BODYWEIGHT MANAGEMENT AND OBESITY PREVENTION STRATEGY FOR A RURAL COMMUNITY; A STUDY PROTOCOL

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Abstract
Obesity presents a significant health challenge globally, influenced by genetic, environmental, and behavioral factors. Its prevalence in Pakistan, particularly in rural communities, contributes to extensive health and economic burdens. This study aims to develop an evidence-based community strategy for bodyweight management and obesity prevention, contextualized within local practices. Using an Explanatory Sequential Mixed-Methods approach, the research involves a systematic review and meta-analysis of obesity interventions, followed by qualitative exploration of community perceptions and experiences. Through purposive sampling, overweight, obese, and normal-weight individuals will participate in interviews, addressing perceptions of ideal weight and strategies for weight management. Trustworthiness will be ensured through rigorous data collection and analysis, adhering to established criteria. Meta-inference, achieved through integrating qualitative and quantitative findings, will guide program development. The proposed program development may enhance the management of obesity in rural Pakistani communities by incorporating evidence-based strategies and community engagement, potentially leading to improved health outcomes.

Introduction
Obesity, defined as the abnormal or excessive accumulation of fat, poses significant health risks (WHO, 2017). Its development is influenced by a combination of genetic factors, environmental conditions (Goodwin, 2002), and health behaviors (CDC, 2020). Obesity is a major contributor to chronic non-communicable diseases and can lead to impaired quality of life (Nyberg et al., 2018), as well as physical, physiological, and mental health issues (Abdelaal, 2017) and psychosocial problems (Djalalinia, 2015). It is associated with increased mortality rates, with obesity-related cancers and cardiovascular diseases carrying particularly high risks (Hamdy, 2021). Additionally, obesity reduces socio-economic productivity (Blüher, 2019), earning the term 'globosity' due to its global prevalence (Chooi et al., 2019).

In the United States, Europe, Arab countries, and India, obesity prevalence rates range from 20% to 55% (Seidell, 2016; WHO, 2014; AlNohair, 2014), while in Pakistan, rates are around 37% in females and 22% in males (Tanzil & Jamali, 2016). The economic burden of obesity in Pakistan is substantial, with a significant portion of health expenditure and GDP allocated to obesity-related diseases (Naeem et al., 2015). Contributing factors to obesity include family history, biological makeup, sociocultural beliefs, education level, and lifestyle choices such as physical inactivity and dietary habits (Nyberg et al., 2018). Indigenous factors in Pakistan, such as local food choices, sedentary lifestyles, illiteracy,

and poverty, exacerbate the issue (Baig, 2018, 2019; Asif et al., 2020). Misconceptions about obesity, including its association with power, further complicate matters (Bhanji et al., 2011).
Prevention efforts targeting obesity and its associated consequences can be effective through community health initiatives and supportive environments promoting healthy lifestyles (WHO, 2021). The current research is set forth to explore public perceptions and experiences regarding obesity in a rural community, particularly in relation to evidence-based interventions, to develop an Evidence-based Bodyweight Management and Obesity Prevention Strategy for a Rural Community

Problem Statement

Obesity is one of the leading causes of chronic non-communicable diseases and the consequence of an impaired quality of life. It is a health condition that can result in multiple complications according to Abdelaal (2017). The escalating prevalence of obesity, both globally and specifically within the context of Pakistan, particularly in rural areas, causes demanding health challenges. Hence this research, to develop the community strategy for the management of bodyweight and prevention of obesity that is grounded in evidence-based practices, was fueled considering the current high prevalence and detrimental consequences of obesity in Pakistan, especially in the rural communities.

Aim and Objectives of the Study

The study aimed to develop a community strategy for the management of bodyweight and prevention of obesity that is grounded in evidence-based practices across the world as well as contextualized in the practices of a specific local indigenous community
The study objectives were:

(a) summarize and analyze the available literature regarding EBI for obesity prevention and management in the community,
(b) explore the perceptions of normal weight as well as the experiences and perceptions of overweight and obese individuals of the community about ideal weight,
(c) develop strategies for body weight reduction and maintenance of normal weight in relation to EBI among community individuals.

Research Questions

1. What are the EBIs for obesity prevention and management and how effective are they for reducing BMI and WC among overweight and obese individuals in the community?
2. What are the perceptions of normal weight and experiences and perceptions of overweight and obese individuals of the community regarding ideal weight?
3. What strategies do the individuals in the community use for weight reduction and maintenance in relation to EBI?

Operational Definitions

Operational definitions of the key concepts used in the study are given here. These concepts include being overweight and obese, body mass index (BMI), waist circumference (WC), and obesity.

Being Overweight and Obese

Being overweight and obese is abnormal or excessive fat accumulation in the body that impairs the health of an individual (WHO, 2020). In the current study, it is assessed through two common measures including BMI and WC.

Body Mass Index (BMI)

The Asian population has a greater body fat percentage for the same age, sex, and BMI as compared to the Caucasian population (Nishida et al., 2004). Therefore, in the current study, the criteria proposed by Misra and Shrivastava (2013) for the South Asian population was used for determining obesity, which is 23-24.9 kg/m^2 as being overweight and $\geq$ 25 kg/m^2 as obesity.

Waist Circumference (WC)

The WC was be used as a second measure for overweight and obesity. WC for males ≥ 40 inches (101.6 cm) and ≥ 35 inches (88.9 cm) for females is defined as obesity (WHO, 2011). Criteria for determining obesity among citizens of Asian countries that are obese if WC ≥ 36 inches (91.44 cm) in males and > 32 inches (81.22 cm) in females were used in the current study (Misra & Shrivastava, 2013).

Methodology

Study Design

Explanatory Sequential Mixed-Methods will be used as the study design (J. W. Creswell & Clark, 2018). The first phase will involve a systematic review and meta-analysis as a quantitative design to systematically assess the available literature on the evidence-based interventions (EBIs) for obesity prevention and management at the community level (Ab, 2010). The second phase of the study will be a qualitative descriptive study (Sandelowski, 2010), in which the perceptions of normal weight, experiences, and perceptions of overweight and obese individuals in the community regarding ideal weight will be explored. Strategies used by the study participants for weight reduction and maintenance of ideal weight will also be explored. The integration of data will be achieved by side-by-side joint display of the findings of the quantitative phase with the qualitative part. The meta-inferences from the joint display will be used for program development, called the strategy (J. W. Creswell & Clark, 2018).

Phase 1: Quantitative Part

The quantitative part of the study will involve a systematic review and meta-analysis of the available literature on evidence-based interventions (EBIs) for obesity prevention and management at the community level (Zeb et al., 2024).

Methods: The step-by-step guide by Tawfik et al. (2019) will be used for conducting a systematic review and meta-analysis.

Inclusion Criteria: Randomized Clinical Trials (RCTs) and quasi-experimental studies on community-based obesity interventions, focusing on outcomes such as BMI, WC, and body weight, published within the last 12 years from 2009 to 2020, will be included (Gao et al., 2008).

Exclusion Criteria: Studies primarily focusing on conditions other than obesity and those conducted in clinical settings will be excluded.

Search Strategy and Database: A comprehensive literature search will be conducted for English-only articles using databases including PubMed, Science Direct, CINAHL, and Google Scholar. Screening will involve reviewing titles, abstracts, and full texts, with study selection presented using the PRISMA Flow chart. Study quality will be assessed using a validated tool by Hong et al. (2018).

Data Extraction: Data extraction will be performed using an Excel sheet, including study type, sample size, characteristics, independent variables (health education and behavior intervention), dependent variables (BMI, waist circumference, and body weight), and results such as mean differences.

Statistical Analysis: Cochrane Review Manager software will be utilized for effect size calculation and forest plots, while funnel plots will identify publication bias.

Phase 2: Qualitative part

The second part of the study will involve a qualitative descriptive study to explore participants' experiences and perceptions regarding ideal weight (Sandelowski, 2010). It will include overweight, obese, and normal-weight individuals, exploring their perceptions and experiences, as well as strategies for weight loss and maintenance.

Study Setting and Participants: The study will take place in a community on the outskirts of Peshawar, Pakistan. A nonprobability purposive sampling technique will be used to recruit participants until data saturation is achieved.

Inclusion Criteria: Participants will include overweight, obese, and normal-weight individuals aged 18 or above, willing to participate in the study.

Exclusion Criteria: Individuals undergoing or having undergone obesity treatment, bariatric surgery, or pregnant women will be excluded.

Data Collection: In-depth interviews will explore participants' perceptions and experiences, utilizing open-ended questions guided by an interview guide. Responses will be recorded through handwritten notes and audiotapes, with field notes documenting participant behaviors and activities. Interviews will be conducted in the local language, later translated into English.

Analysis of Qualitative Data: Data analysis will occur simultaneously with data collection, involving transcription, coding, categorization, and thematic analysis. Findings will be compared with quantitative results for similarities and differences.

Trustworthiness of the qualitative phase: The study will ensure credibility, dependability, conformability, and transferability following Lincoln and Guba's criteria (1985). Collaborative qualitative analysis (CQA) techniques and thick description of data will enhance trustworthiness.

Meta-inference and Integration

Integration of the qualitative and quantitative strands of the proposed mixed methods research will be achieved through Meta-inference, which is considered a crucial outcome of mixed-methods studies, achieved through connecting or combining inferences from both qualitative and quantitative approaches. The process involves separate analyses of qualitative and quantitative data followed by integration to derive overarching conclusions. Meta-inference is often visualized using joint displays, which demonstrate how findings from different methods are combined. In the current study, meta-inference will be generated through a statistics-by-themes joint display, presenting integrated findings from both quantitative meta-analysis and qualitative descriptive-exploratory design.

Rigor in Mixed Methods

The study will adhere to the Rigorous Mixed-Methods Framework developed by Harrison, Reilly, & Creswell (2020), ensuring rigorous data collection, analysis, integration, and using a mixed-methods design.

Program Development

To develop a contextual program for excess weight management the WHO (2012) planning model for the development of a health education program will be used from the findings of mixed-methods research. The overall process in the program include these steps (1) Aims and objectives of the program (2) Assessment (3) Strategies including Awareness, Education, and Counselling (4) Evaluation of Continuous management. The diagrammatical presentation of the program is as in Figure 9. This forms the acronym **AAECE**

Ethical Considerations:

Ethical approval will be obtained from the institute's ethics review board. Informed consent will be obtained from participants, and approval from local government officials will be secured

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