Research in Health & Medical Sciences *Review Article*

2025 January; 4(2)

Metabolic syndrome and quality of Life: A narrative review of physical, psychological, and social dimensions

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Received: 2026/2; Revised: 2026/6; Accepted: 2026/6

Abstract

Metabolic syndrome (MetS) is a major public health challenge today and, beyond its physical consequences, may affect various dimensions of daily functioning and well-being. Despite the growing body of studies in this area, heterogeneity in health-related quality of life (HRQOL) assessment instruments has limited the comparison and interpretation of findings. The aim of this narrative review was to examine the available evidence on HRQOL among adults with MetS, focusing exclusively on studies that used the WHOQOL-BREF questionnaire.

Studies were identified by searching using keywords related to MetS, health-related quality of life, and WHOQOL-BREF questionnaire. Eligible articles were selected based on predefined inclusion criteria. This review focused on studies conducted in adult populations that assessed HRQOL using the WHOQOL-BREF instrument. Relevant findings were pooled for validation without conducting formal quality assessment or meta-analysis.

The evidence reviewed suggests that MetS is commonly associated with reduced HRQOL, particularly in the physical and mental domains of the WHOQOL-BREF. Several studies have reported lower HRQOL scores among individuals with MetS compared with non-diseased populations, and some evidence suggests more severe impairment among women. Findings regarding social relationships and environmental domains were less consistent across studies. In conclusion, the existing literature suggests that MetS is often associated with reduced health-related quality of life, highlighting the importance of considering patient-reported outcomes alongside clinical indicators in the management of MetS.

Keywords: Metabolic syndrome, Health-related quality of life, WHOQOL-BREF, Narrative Review

Introduction

In recent decades, the prevalence of metabolic syndrome (MetS) has increased in many countries and has become one of the major public health challenges worldwide (1). MetS is a cluster of interrelated metabolic disorders including central obesity, hypertension, elevated fasting blood glucose, elevated triglycerides, and decreased high-density lipoprotein (HDL) (2). MetS increases the risk of cardiovascular disease, type 2 diabetes, and premature mortality (3). Regardless of the numerous definitions of MetS, according to the International Diabetes Federation (IDF), MetS is defined as: the presence of central obesity with at least two of the following: hypertension, decreased HDL, increased fasting plasma glucose, and increased triglycerides (4). The prevalence of MetS in the adult population is estimated to be 25% worldwide (2) and 34% in Iran (5). The clinical consequences of MetS are well known, but its widespread effects on daily functioning, mental health, and social participation of patients have received less attention, which highlights the need to pay attention to outcomes beyond purely biological indicators, namely the health-related quality of life (HRQOL) of individuals (6).

HRQOL is a multidimensional concept that reflects the physical, psychological, social, and environmental dimensions of an individual's well-being in direct relation to health status (7). In chronic disease management, increasing HRQOL has become a major goal, often replacing the goal of curing the disease or increasing survival (8). Despite the body of research that has been conducted on the impact of MetS on health-related quality of life, this issue is still controversial (9). Studies that have examined the association between MetS and HRQOL have shown contradictory results and uncertainties (10). For example, although most studies indicate a significant association between MetS and decreased quality of life, especially in physical and psychological dimensions; however, the magnitude and pattern of this effect have not been reported uniformly across studies, many of which have reported this association only in women (11, 12). Others have suggested that this association is only significant when MetS is accompanied by factors such as depression (13) or high body mass index (14).

One of the fundamental challenges in interpreting and summarizing existing findings is the heterogeneity of HRQOL measurement instruments (15). Questionnaires such as SF-36, EQ-5D, and various WHOQOL instruments differ in terms of conceptual framework, dimensionality, and sensitivity to health changes, making it difficult to compare study results (16, 17). Meanwhile, the the World Health Organization Quality of Life – Brief Version (WHOQOL-BREF) questionnaire, covering the four main dimensions of physical health, mental health, social relationships, and living environment, is considered a comprehensive and practical tool that is suitable for examining the multidimensional consequences of MetS in the adult population (16). To date, according to our database searches, there has been no review that specifically focuses on HRQOL measured with a single standardized instrument, such as the WHOQOL-BREF, in adults with MetS. Such an approach could provide a clearer picture of the true impact of the syndrome on different dimensions of daily life by reducing methodological heterogeneity. Accordingly, our aim in this review is to examine HRQOL in adults with MetS, focusing exclusively on studies that used the WHOQOL-BREF questionnaire.

Methods

This study was conducted as a narrative review with the aim of synthesizing the available evidence on HRQOL in adults with MetS worldwide. Literature searches were conducted in databases including PubMed and Google Scholar, as well as Iranian scientific databases including the Scientific Information Database (SID) and Magiran from 1988 to December 2025. The search strategy included the main keywords including a combination of the terms metabolic syndrome, MetS, quality of life, Qol, health-related quality of life, HRQOL, WHOQOL-

BREF which were combined using logical operators AND and OR.

Inclusion criteria included studies that:

1. They were conducted in an adult population,
2. They examined individuals with MetS,
3. They assessed HRQOL, and
4. They used the WHOQOL-BREF questionnaire as the measurement instrument.

We focused on original articles with observational or interventional designs conducted worldwide without geographical restrictions. In contrast, studies conducted in younger age groups, studies that used different instruments to measure HRQOL, as well as review articles, meta-analyses, qualitative studies, and case reports were excluded from the present review to avoid methodological heterogeneity.

The study selection process was carried out in two stages. In the first stage, the titles and abstracts of the articles identified in the screening and irrelevant cases were removed. In the second stage, the full text of the eligible articles was reviewed and finally, the studies that met all the inclusion criteria were included in the review. Key data including study characteristics (author, year of publication, country), sample characteristics, research design and results related to the four domains of the WHOQOL-BREF questionnaire were extracted. The findings were combined descriptively and analytically, and common patterns and differences between the studies were discussed narratively.

Results and Discussion

The review of studies showed that MetS was associated with a decrease in HRQOL in most studies. In some studies, people with MetS reported lower scores in all or some domains of quality of life; accordingly, the findings are reviewed and interpreted separately for each domain of the WHOQOL-BREF questionnaire.

Physical domain

The results of several studies showed that the physical dimension of HRQOL in people with MetS was reported to be significantly lower than in non-diseased populations in most studies (18-20). The decrease in scores in this dimension was mainly associated with the presence of central obesity, chronic fatigue, limitations in daily activities, and sleep problems (18, 21). For example, a cross-sectional study conducted by Luiz Vinicius and colleagues in Brazil shows that people with MetS have lower physical HRQOL scores (22). Or a clinical trial study of the effectiveness of a lifestyle intervention based on yoga and diet found that only the physical domain of HRQOL in people with MetS improved after the intervention (23). The decrease in HRQOL in the physical dimension could reflect the cumulative burden of MetS components on the individual's physical functioning (24). These findings are consistent with previous reports of an association between MetS and decreased physical functioning. This previous evidence has shown that the simultaneous presence of multiple metabolic risk factors can affect an individual's perception of physical health and ability to perform daily activities (25).

Psychological domain

A cross-sectional study conducted in Iran showed that the psychological dimension of the WHOQOL-BREF was reduced in many individuals with MetS compared to those without (26). These findings may indicate the role of psychological factors associated with MetS. The association between metabolic disorders and symptoms of depression, anxiety, and low self-esteem has been well documented in previous studies (20). A clinical trial study conducted by Carvalho-Limo showed that after physical exercise, individuals with MetS improved their HRQOL in the physical, psychological, and social domains (27). Therefore, the results of this study suggest that physical activity-based interventions can simultaneously improve multiple HRQOL dimensions in individuals with MetS (28).

Social Relationships domain

In the social relationships dimension, the results of the studies were more heterogeneous;

some studies reported a significant decrease in social HRQOL in people with MetS (29), while others did not observe a significant difference (26). Some studies, such as a cross-sectional study using cohort data, found an association between MetS and HRQOL only in some components of MetS, such as decreased HDL levels (18). This heterogeneity in the presence or absence of an association could be due to differences in culture, social structures, and support systems in the populations studied. However, in cases where a decrease in social HRQOL was observed, physical and psychological limitations due to MetS likely played a mediating role. This highlights the importance of psychosocial interventions in addition to the clinical management of MetS (27).

Social Environment domain

In reviews of included studies, it has often been reported that the physical and psychological domains of HRQOL are negatively affected by MetS, whereas there is little evidence that the social environment domain is independently associated with MetS. For example, large population data from the Isfahan Healthy Heart Program did not find significant differences in environmental HRQOL between adults with and without MetS (29). The few associations observed in clinical or cross-sectional samples often reflect the mediating effects of other factors rather than a direct effect of MetS on the environmental domain (19).

Overall, the reviewed evidence indicates that MetS is consistently associated with impairments in health-related quality of life, particularly in the physical and psychological domains. Findings regarding the social relationships domain were heterogeneous and appeared to be influenced by contextual and cultural factors, while the social environment domain showed little consistent independent association with MetS.

Conclusion

Overall, the findings of this narrative review indicate that MetS is often associated with a reduced health-related quality of life, and this reduction is particularly pronounced in some domains, including physical and psychological dimensions. The available evidence suggests that MetS can affect individuals' subjective experience of health and daily functioning beyond clinical outcomes. Given these findings, assessing HRQOL can be considered as a complementary and meaningful component alongside biomarkers in the management and monitoring of MetS.

Strengths and Limitations

The strengths of this narrative review include its targeted focus on HRQOL in people with MetS using the standard WHOQOL-BREF questionnaire, which allowed for better comparability of findings. In addition, by including studies conducted in different populations and diverse cultural backgrounds, the present review provides a comprehensive picture of the state of HRQOL in people with MetS. Due to its narrative nature, this review lacks a formal assessment of study quality and analysis of risk of bias. In addition, the heterogeneity of study designs and the predominance of cross-sectional studies limit the possibility of drawing causal conclusions and performing quantitative data synthesis. The limitation of the search to English and Persian articles may also have led to the exclusion of some relevant studies.

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