

Knowledge, Attitudes, and Practices (KAP) of Adults with Hypertension Regarding Therapeutic Lifestyle Management and Their Association with Self-Efficacy for Dietary and Exercise Adherence: A Health Management Perspective in Karachi, Pakistan

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Abstract

Background: Hypertension requires sustained lifestyle modification in addition to appropriate medical management. Understanding behavioral and psychological factors associated with adherence can assist healthcare managers in developing more effective patient-centered interventions.

Objective: This study examined the knowledge, attitudes, and practices (KAP) of adults with hypertension regarding therapeutic lifestyle management and assessed their association with self-efficacy for dietary and exercise adherence in Karachi, Pakistan.

Methods: A quantitative, cross-sectional study was conducted among 200 adults with hypertension. Data were collected using a structured questionnaire assessing knowledge, attitudes, lifestyle-management practices, dietary and exercise self-efficacy, and adherence. Descriptive statistics, Spearman correlation, and multiple regression analyses were used to examine relationships among the study variables.

Results: Lifestyle-management practices were significantly associated with dietary and exercise adherence. The dietary adherence regression model explained 37.4% of the variance, with attitudes and lifestyle practices emerging as significant predictors. The exercise adherence model explained 40.0% of the variance, with lifestyle

practices and exercise self-efficacy identified as significant predictors. Exercise self-efficacy demonstrated a stronger behavioral relationship with exercise adherence than dietary self-efficacy did with dietary adherence.

Conclusion: Effective hypertension management should incorporate behavioral and self-efficacy-focused strategies alongside patient education. Healthcare managers should prioritize interventions that strengthen practical lifestyle skills, confidence, and sustained patient engagement.

Keywords: Hypertension; Lifestyle Management; Knowledge; Attitudes; Practices; Self-Efficacy; Dietary Adherence; Exercise Adherence

Introduction

Hypertension is one of the most important modifiable risk factors for cardiovascular disease, stroke, chronic kidney disease, and premature mortality worldwide. Despite substantial progress in screening and treatment, elevated blood pressure remains highly prevalent among adults and continues to impose a considerable burden on health systems. The global number of adults living with hypertension has increased substantially over recent decades, while a large proportion of affected individuals remain undiagnosed, untreated, or inadequately controlled (World Health Organization [WHO], 2023). Hypertension is particularly challenging in low- and middle-income countries, where rapid urbanization, dietary changes, sedentary lifestyles, limited preventive healthcare, and socioeconomic inequalities can contribute to increasing cardiovascular risk (Mills et al., 2020; NCD Risk Factor Collaboration [NCD-RisC], 2021).

Blood pressure control depends not only on pharmacological treatment but also on sustained behavioral modification. Therapeutic lifestyle modification (TLM) constitutes an important component of hypertension management and generally includes dietary improvement, reduction of sodium intake, and maintenance of a healthy body weight, regular physical activity, and moderation of alcohol consumption, smoking cessation, and effective management of other cardiovascular risk factors. Contemporary hypertension guidelines emphasize that lifestyle modification should be initiated alongside appropriate medical treatment because behavioral changes can reduce blood pressure and improve overall cardiovascular health (Unger et al., 2020; Mancia et al., 2023). However, the effectiveness of lifestyle recommendations depends heavily on whether patients understand them, accept their importance, and translate them into consistent daily practices.

The Knowledge, Attitudes, and Practices (KAP) framework provides a useful approach for examining these behavioral dimensions. Knowledge refers to an individual's understanding of hypertension, its consequences, risk factors, recommended lifestyle behaviors, and methods of disease management. Attitudes encompass perceptions, beliefs, motivation, perceived benefits, and willingness to undertake recommended lifestyle changes. Practices represent the actual behaviors adopted by individuals in their everyday lives. Although knowledge is necessary for informed decision-making, having adequate knowledge does not automatically result

in appropriate health behavior. Individuals may understand the importance of reducing salt or exercising regularly but may still experience difficulties incorporating these behaviors into their daily routines.

This distinction is particularly relevant in hypertension because lifestyle recommendations often require long-term behavioral commitment. A patient may know that excessive sodium consumption contributes to elevated blood pressure but continue consuming salty foods because of established dietary preferences, family eating patterns, convenience, affordability, or limited availability of healthier alternatives. Similarly, an individual may understand the cardiovascular benefits of exercise but remain physically inactive because of occupational demands, environmental barriers, and lack of time, physical limitations, or insufficient confidence in maintaining an exercise routine. Consequently, investigating knowledge alone provides an incomplete picture of lifestyle modification among adults with hypertension.

Self-efficacy provides an important psychological explanation for the translation of knowledge and attitudes into behavior. Based on social cognitive theory, self-efficacy refers to an individual's belief in their ability to successfully perform a particular behavior under relevant circumstances. In hypertension management, dietary and exercise self-efficacy reflects the confidence patients have in their ability to maintain healthier eating patterns and participate in regular physical activity despite challenges or competing demands. Higher self-efficacy has been associated with greater engagement in health-promoting behaviors and improved management of chronic diseases (Bandura, 2021; Magasi et al., 2021).

Dietary adherence represents a particularly important aspect of therapeutic lifestyle modification. Dietary approaches to hypertension management emphasize increased consumption of fruits, vegetables, whole grains, legumes, and other nutrient-rich foods while reducing sodium, saturated fats, and highly processed foods. Evidence indicates that dietary interventions can produce meaningful improvements in blood pressure, particularly when patients maintain them over time (Filippou et al., 2020; Chiavaroli et al., 2021). Nevertheless, dietary adherence is influenced by cultural norms, food availability, household practices, economic circumstances, and individual preferences. These factors may be especially relevant in Pakistan, where traditional diets can contain considerable amounts of salt, refined carbohydrates, cooking oils, and calorie-dense foods.

Physical activity is another fundamental component of hypertension management. Regular moderate-intensity physical activity can contribute to reductions in blood pressure and improve cardiovascular fitness, body composition, glucose metabolism, and psychological well-being. Recent evidence supports physical activity as an important non-pharmacological intervention for adults with hypertension (Naci et al., 2020; Börjesson et al., 2021). International guidelines commonly recommend regular aerobic physical activity complemented by muscle-strengthening activities, according to individual capacity and clinical circumstances (Unger et al., 2020; Mancia et al., 2023). Despite these recommendations, physical inactivity remains widespread

globally, and many individuals with chronic diseases fail to achieve recommended activity levels.

The relationship between self-efficacy and exercise adherence is therefore particularly important. Individuals with stronger confidence in their ability to exercise are more likely to initiate and sustain physical activity, particularly when faced with barriers such as lack of time, fatigue, unfavorable weather, limited facilities, or competing family and occupational responsibilities. Conversely, low self-efficacy can discourage behavioral initiation and contribute to discontinuation following minor setbacks. Understanding this relationship can help healthcare professionals move beyond simply providing lifestyle advice toward developing interventions that strengthen patients' confidence and behavioral capabilities.

The relationship between KAP and self-efficacy may also be multidimensional. Knowledge can contribute to self-efficacy by helping individuals understand why a particular behavior is beneficial and how it can be implemented. Positive attitudes may strengthen motivation to adopt lifestyle modifications, while successful practices may reinforce confidence through behavioral mastery. However, the relationship is unlikely to be entirely linear. An individual may possess excellent knowledge but low self-efficacy, while another may have moderate knowledge but strong confidence and consistent lifestyle practices. Examining these constructs simultaneously can therefore provide a more comprehensive understanding of hypertension self-management.

Hypertension control remains a major public health concern in Pakistan. The country's rapidly changing demographic and lifestyle environment has contributed to increasing exposure to cardiovascular risk factors, including unhealthy diets, physical inactivity, obesity, tobacco use, and psychosocial stress. Pakistan also faces challenges involving healthcare access, continuity of care, health literacy, and long-term management of noncommunicable diseases. These challenges make behavioral self-management particularly important because lifestyle modification can be implemented at the individual and household level and can complement pharmacological therapy.

Karachi provides an especially relevant setting for investigating lifestyle-related hypertension management. As a large metropolitan city, Karachi contains substantial socioeconomic, cultural, and occupational diversity. Urban living can facilitate access to processed foods, restaurant meals, sugar-sweetened beverages, and sedentary occupations while simultaneously creating barriers to regular physical activity. Long commuting times, occupational pressures, environmental conditions, and limited opportunities for safe recreational activity may influence the ability of adults to maintain recommended exercise routines. Family food practices and cultural expectations may further influence dietary behavior.

Research from Pakistan and other South Asian settings has demonstrated persistent gaps between awareness of noncommunicable diseases and actual adoption of recommended preventive behaviors. Recent studies have emphasized that health literacy, perceived control, motivation, socioeconomic circumstances, and access to appropriate health information can influence chronic disease self-management (Hassan et al., 2021; Siddiqui et al., 2022). Furthermore, interventions addressing

multiple behavioral determinants are generally more promising than approaches that rely exclusively on information provision. This highlights the importance of assessing not only what patients know but also how they perceive lifestyle modification and whether they believe they can successfully implement it.

The increasing emphasis on patient-centered chronic disease management further supports investigation of self-efficacy. Contemporary hypertension care increasingly recognizes patients as active participants rather than passive recipients of medical advice. Effective management requires patients to monitor their condition, follow medication regimens, modify dietary patterns, remain physically active, attend follow-up appointments, and respond appropriately to changes in health status. Self-efficacy may influence several of these behaviors because patients who believe that they can manage their condition are more likely to engage proactively in self-care (Carey et al., 2022).

The importance of this issue has also been reinforced by international hypertension initiatives. The WHO has emphasized improving hypertension detection, treatment, and control through integrated health-system and patient-level approaches (WHO, 2021, 2023). Similarly, recent European and international hypertension guidelines have emphasized lifestyle modification as a fundamental component of comprehensive cardiovascular risk reduction (Unger et al., 2020; Mancia et al., 2023). These recommendations demonstrate that behavioral modification is not an optional component of hypertension care but an integral part of evidence-based disease management.

However, there remains a need for context-specific evidence examining how KAP relates to self-efficacy among adults with hypertension in Karachi. Studies focusing exclusively on prevalence, medication adherence, or general hypertension awareness may not adequately explain why patients do or do not sustain recommended dietary and exercise behaviors. A KAP-based assessment combined with self-efficacy measures can provide more detailed information about the behavioral mechanisms underlying lifestyle adherence. Such information can be particularly valuable for designing culturally appropriate patient education, counseling, and behavioral interventions.

The present study therefore examined the knowledge, attitudes, and practices of adults with hypertension regarding therapeutic lifestyle modifications and investigated their association with self-efficacy for dietary and exercise adherence in Karachi, Pakistan. The study adopted a quantitative cross-sectional approach and focused on adults diagnosed with hypertension. By examining these constructs together, the research sought to identify whether greater knowledge, more favorable attitudes, and better lifestyle practices were associated with stronger confidence in maintaining dietary and physical activity behaviors.

The study is significant from both clinical and public health perspectives. Clinically, understanding behavioral and psychological determinants may enable healthcare professionals to tailor counseling according to patients' specific needs. Patients with adequate knowledge but poor self-efficacy may require skills-based interventions rather than additional information, whereas patients with inadequate knowledge may

benefit from structured education. From a public health perspective, identifying modifiable determinants of lifestyle adherence can inform community-based hypertension programs and health promotion initiatives. The findings may also contribute to the limited local literature concerning the interaction between KAP and self-efficacy among Pakistani adults living with hypertension.

Methodology

The study employed a quantitative, cross-sectional research design to assess knowledge, attitudes, and practices regarding therapeutic lifestyle modifications and their association with self-efficacy for dietary and exercise adherence among adults with hypertension in Karachi, Pakistan. Data were collected at a single point in time, allowing the researchers to examine associations among the study variables within the selected population.

A sample of 140 adults diagnosed with hypertension was included in the study. Participants were recruited from the relevant healthcare/community setting in Karachi. Adults with a confirmed history of hypertension who were able to understand the study questionnaire and provide informed consent were eligible for participation. Individuals who were unable to provide reliable responses or had conditions that prevented meaningful participation were excluded.

Data were collected through a structured questionnaire. The instrument assessed participants' demographic characteristics, knowledge concerning hypertension and therapeutic lifestyle modifications, attitudes toward recommended lifestyle behaviors, and reported practices related to diet and physical activity. Self-efficacy was assessed in relation to participants' perceived ability to maintain recommended dietary and exercise behaviors despite potential barriers. Items were structured using appropriate response scales, with higher scores representing greater levels of the respective constructs.

The collected data were coded and analyzed using statistical software. Descriptive statistics, including frequencies, percentages, means, and standard deviations, were used to summarize the study variables. Inferential analysis was conducted to determine the associations between KAP dimensions and dietary and exercise self-efficacy. Appropriate correlation and/or regression procedures were applied according to the measurement characteristics and distribution of the variables. Statistical significance was assessed at the conventional $p < .05$ level.

Ethical principles were maintained throughout the study. Participants were informed about the purpose of the research, their voluntary participation, confidentiality, and their right to withdraw. Informed consent was obtained before data collection, and participants' identities were not disclosed in the research report.

Results and Discussion

Table 1: Spearman Correlations

Relationship	ρ	p
Knowledge $\rightarrow$ Dietary Self-Efficacy	.319	<.001

Relationship	ρ	p
Knowledge → Exercise Self-Efficacy	.550	<.001
Attitudes → Dietary Self-Efficacy	.312	<.001
Attitudes → Exercise Self-Efficacy	.529	<.001
Practices → Dietary Self-Efficacy	.310	<.001
Practices → Exercise Self-Efficacy	.594	<.001
Dietary Self-Efficacy → Dietary Adherence	.230	.001
Exercise Self-Efficacy → Exercise Adherence	.555	<.001
Practices → Dietary Adherence	.536	<.001
Practices → Exercise Adherence	.484	<.001

The findings indicate that stronger lifestyle-management practices were particularly associated with exercise self-efficacy and dietary adherence. Exercise self-efficacy also showed a stronger association with exercise adherence than dietary self-efficacy showed with dietary adherence.

Table 2 Multiple Regression Predicting Dietary Adherence

Predictor	B	SE	β	t	p
Constant	1.229	0.307	—	4.00	<.001
Knowledge of TLM	0.104	0.077	.107	1.35	.180
Attitudes toward TLM	0.225	0.084	.237	2.68	.008
Lifestyle Management Practices	0.334	0.080	.341	4.20	<.001
Dietary Self-Efficacy	0.003	0.071	.002	0.04	.971

The regression model was statistically significant and explained 37.4% of the variance in dietary adherence. Attitudes toward therapeutic lifestyle management and lifestyle-management practices were significant positive predictors. Lifestyle practices demonstrated the strongest effect ($\beta = .341$), followed by attitudes ($\beta = .237$). Knowledge and dietary self-efficacy did not make significant independent contributions when the other predictors were controlled.

Table 3. Multiple Regressions Predicting Exercise Adherence

Predictor	B	SE	β	t	p
Constant	0.827	0.245	—	3.37	.001
Knowledge of TLM	0.151	0.081	.147	1.85	.066
Attitudes toward TLM	-0.104	0.087	-.104	-1.20	.233
Lifestyle Management Practices	0.344	0.087	.332	3.94	<.001
Exercise Self-Efficacy	0.357	0.080	.335	4.44	<.001

The regression model significantly predicted exercise adherence and explained 40.0% of its variance. Lifestyle-management practices ($\beta = .332$, $p < .001$) and exercise self-

efficacy ($\beta = .335$, $p < .001$) were significant positive predictors. Exercise self-efficacy had the slightly stronger standardized effect, indicating that confidence in maintaining exercise was an important determinant of adherence. Knowledge approached significance ($p = .066$), whereas attitudes were not significant predictors. Actual lifestyle-management practices were consistently important for both dietary and exercise adherence, while self-efficacy was particularly relevant to exercise adherence. The results suggest that hypertension-management programs should move beyond information provision toward behavioral skills, confidence-building, patient engagement, goal setting, and continuous self-management support. This is consistent with recent hypertension guidance emphasizing lifestyle modification as a core component of effective long-term hypertension management (Mancia et al., 2023; Unger et al., 2020). The findings also support the broader evidence that self-efficacy is associated with chronic-disease self-management and adherence to recommended health behaviors.

Conclusion

This study demonstrated that therapeutic lifestyle management among adults with hypertension is influenced more strongly by behavioral practices, attitudes, and self-efficacy than by knowledge alone. Lifestyle-management practices significantly predicted both dietary and exercise adherence, while exercise self-efficacy emerged as an important determinant of exercise adherence. These findings indicate that hypertension management programs should extend beyond conventional health education and incorporate behavioral counseling, confidence-building strategies, goal setting, and continuous patient support. From a management sciences perspective, strengthening patients' self-management capabilities may improve adherence to recommended lifestyle behaviors and contribute to more effective long-term hypertension management.

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