e-ISSN : 2597-6052

MPPKI MEDIA PUBLIKASI PROMOSI KESEHATAN INDONESIA

Research Articles Open Access

Understanding Teachers' Motivation and Barriers in Implementing Balanced Nutrition Guidelines in Indonesia: A Self-Determination Theory Perspective

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ARTICLE INFO

Manuscript Received: 27 Apr, 2025
Revised: 27 Jun, 2025
Accepted: 27 Jul, 2025
Date of Publication: 11 Sept, 2025
Volume: 8
Issue: 9
DOI: 10.56338/mppki.v8i9.7921

KEYWORDS

Balance Nutrition Guidelines;
Barriers;
Self-Determination Theory;
Teachers

ABSTRACT

Introduction: Non-communicable diseases (NCDs) are currently the leading cause of morbidity and mortality worldwide, including in Indonesia. The Indonesian government promotes balanced nutrition guidelines to encourage healthy lifestyles, with teachers expected to model these behaviors. This study is grounded in Self-Determination Theory (SDT), which posits that motivation, autonomy, competence, and relatedness influence health behaviors. It aims to explore teachers' practices and perceived barriers in implementing balanced nutrition guidelines.

Methods: A qualitative study using Focus Group Discussion (FGD) was conducted involving 11 teachers from a public school in Makassar City, Indonesia. The discussion was guided by a set of structured questions developed based on the 10 key messages of the Indonesian balanced nutrition guidelines. The FGD explored daily dietary practices, physical activity, and perceived barriers to the adoption of balanced nutrition recommendations.

Results: The study involved 11 teachers from a public senior high school in Makassar City, Indonesia, most of whom were female and over 40 years old. The findings showed that teachers implemented the guidelines only partially. Practices included consuming vegetables only once a day, preparing simple side dishes such as fish or tempeh, consuming rice as the main and often sole staple food, inadequate water consumption, and performing only light or incidental physical activity. Several barriers were identified, including limited time for food preparation due to work demands, lack of breakfast habits, fear of frequent urination due to increased water intake, and limited time or motivation to engage in physical activity. Teachers also expressed that health behaviors were not yet a priority in their daily routines. These behaviors were interpreted through SDT constructs, highlighting how unmet psychological needs hinder full adoption of balance nutrition guidelines.

Conclusion: The study highlights that while teachers are aware of balanced nutrition guidelines, their implementation remains limited due to various time, behavioral, and motivational barriers. Interventions based on SDT that promote autonomy, competence, and social support may enhance the adoption of balanced nutrition practices among teachers.

Publisher: Fakultas Kesehatan Masyarakat Universitas Muhammadiyah Palu

INTRODUCTION

Non-communicable diseases (NCDs) are currently the leading cause of death globally, responsible for more than 70% of all deaths (1). NCDs such as cardiovascular diseases, cancers, respiratory disorders, diabetes, and dementia not only cause premature mortality but also result in significant disability, reducing the quality of life of affected individuals (2). Furthermore, these diseases impact productivity levels at both individual and population levels, leading to economic losses for countries due to reduced workforce participation and increased healthcare costs (3). Indonesia is experiencing similar trends, where the burden of NCDs continues to increase and contributes significantly to national health challenges (4).

The increasing prevalence of NCDs is largely driven by modifiable risk factors, including poor dietary patterns and sedentary lifestyles, in addition to non-modifiable factors such as age and genetic predisposition, as well as physiological factors like hypertension and obesity (5). Among these modifiable factors, low adherence to national dietary guidelines represents a critical challenge, especially among adult working populations who often struggle with time constraints, stress, and competing priorities (6). These lifestyle pressures may prevent consistent application of healthy eating recommendations, ultimately contributing to the escalating burden of NCDs.

Interventions targeting these modifiable risk factors have been shown to be effective in reducing the burden of NCDs, both in developed and developing countries (7). Internationally, public health efforts have focused on increasing physical activity (8) and promoting healthier dietary patterns (9) as key components of NCD prevention strategies. Despite these efforts, unhealthy dietary habits remain widespread, characterized by inadequate intake of fruits and vegetables (10) high consumption of sodium, and insufficient consumption of whole grains and fiber (11).

Several complementary strategies have also been introduced globally, such as front-of-package food labeling, designed to support consumers in making healthier food choices (12). However, although these strategies show promise, their effectiveness heavily relies on the public's awareness and willingness to modify behaviors, which are influenced by personal, cultural, and socioeconomic factors. Prevention through behavior change, especially in dietary practices, is essential in breaking the trajectory of NCDs and reducing their prevalence and consequences.

One of the most effective preventive approaches is the implementation of dietary guidelines in daily life. The primary purpose of the Dietary Guidelines is to assist policymakers, nutritionists, and healthcare professionals in promoting a healthy and nutritionally balanced diet for individuals and their families (13). In Indonesia, the Ministry of Health has developed and promoted the Balanced Nutrition Guidelines since 2014, encompassing four pillars and ten key messages intended to guide the public towards healthier and more balanced eating behaviors, complemented by physical activity and hygiene practices (14). These guidelines serve as a comprehensive framework aimed at supporting health promotion and NCD prevention efforts at the population level. However, studies examining the actual implementation of these guidelines, particularly among specific adult working groups such as teachers, are still limited. Teachers are an important target group due to their dual roles as community educators and role models for students, as well as being part of the adult productive age group that is also vulnerable to NCDs due to occupational stress and lifestyle habits.

Despite the existence of these guidelines, limited research has explored the barriers that hinder working adults such as teachers from implementing balanced nutrition in their daily lives. Most studies to date have focused either on students, young adults, or the general population, leaving a knowledge gap regarding how working adults with busy schedules perceive and adopt such guidelines (7,8). This gap is particularly important given the role of teachers as both influencers in school health environments and members of the productive age group who face unique time, workload, and institutional culture challenges that may limit their ability to practice what is promoted in public health campaigns (15).

This study is framed within the Self-Determination Theory (SDT) by Deci and Ryan, which posits that individuals' motivation to engage in health behaviors is driven by the fulfillment of three basic psychological needs: autonomy, competence, and relatedness (16). When these needs are met, individuals are more likely to internalize health behaviors and maintain them over time. Conversely, barriers such as time constraints, habitual practices, lack of perceived competence, and unsupportive environments can undermine intrinsic motivation and result in partial or inconsistent adoption of healthy practices (17). By applying SDT, this study seeks to explore how teachers' psychological needs interact with the challenges they face in implementing balanced nutrition behaviors in

accordance with national guidelines. Understanding the link between motivational factors and practical behaviors is essential to designing effective and sustainable interventions.

Previous studies have investigated factors that influence health-related behaviors in structured professional settings. For instance, Clohessy et al. (2019) identified individual, social, and environmental factors that shape dietary behavior among office-based workers. Their findings emphasized that even among educated professionals, contextual and motivational barriers such as time pressure and workplace culture can significantly hinder the adoption of healthy eating habits(18).

The relevance of SDT in Southeast Asian educational settings has also been documented. A large-scale study among Indonesian secondary school students revealed that perceived teacher support for autonomy, competence, and relatedness significantly predicted students' autonomous motivation. Interestingly, autonomy support appeared to be less prominent than in Western settings, reflecting cultural variations within collectivist societies. These findings confirm the applicability of SDT within the Indonesian context. Given the shared cultural and institutional settings, it is plausible that similar motivational dynamics may also influence teachers' behaviors and engagement with health-promoting practices (19).

Incorporating this body of evidence helps position the present study within a broader empirical framework. It underscores the need to explore how psychological needs and workplace barriers intersect to influence teachers' own health-related behaviors. Therefore, this study aims to examine the practices of balanced nutrition among a group of teachers in Makassar City, Indonesia, and to identify the obstacles they face in implementing the Balanced Nutrition Guidelines. This research addresses a critical evidence gap in understanding dietary behavior among working adults in Indonesia and offers actionable insights for designing health promotion strategies that integrate motivation based frameworks such as SDT to support NCD prevention.

METHOD

Research Type

Qualitative descriptive study using a Focus Group Discussion (FGD) approach.

Population and Sample/Informants

Participants were selected using purposive sampling with maximum variation to capture a diverse range of perspectives. The selection considered teacher-specific characteristics such as length of teaching experience (tenure), subject specialization (e.g., science, language, physical education), and school level (elementary and junior high school). These variation parameters were chosen to ensure the inclusion of differing professional contexts and potential influences on dietary behavior and the implementation of the Balanced Nutrition Guidelines

Research Location

The study was conducted at a public senior high school, 16 Senior High School Makassar, located in Makassar City, Indonesia.

Instrumentation or Tools

Data were collected using one focus group discussion session, which was guided by a structured FGD guide developed based on the ten key messages of the Indonesian Balanced Nutrition Guidelines.

Data Collection Procedures

Data were collected through one FGD session lasting approximately 90 minutes, conducted face-to-face in a school meeting room. The discussion was moderated by the principal researcher and followed a semi-structured guide. Informed consent was obtained from all participants, and the session was audio recorded.

Data Analysis

Data were transcribed verbatim and analyzed thematically using Braun and Clarke's framework as cited in Cropley (2021). The process included familiarization with data, coding, theme development, and peer debriefing to enhance analytical rigor (20). To ensure analytic rigor, several strategies were employed throughout the analysis

process. Prior to coding, all coders received training and orientation on the thematic analysis framework and the study's objectives to ensure consistency in interpretation. Coding was performed independently by two researchers, followed by discussion meetings to resolve discrepancies and refine code definitions.

Peer debriefing sessions were conducted with senior qualitative researchers to critically examine theme development and challenge potential researcher biases. In addition, member checking was carried out by sharing preliminary themes with a subset of participants to assess resonance and clarity with their lived experiences. Feedback from participants confirmed the relevance and accuracy of the interpretations, strengthening the credibility of the finding.

RESULTS

A total of 11 participants were involved in this study, comprising the headmaster, academic vice headmaster, two sports teachers, and seven subject teachers at a public senior high school in Makassar City. Participants were predominantly female (81.82%) and over 40 years old (72.73%). Most held positions as subject teachers (63.64%) as shown in Table 1.

Table 1. Characteristic of Participants in the Focus Group Discussion

Variables	n (%)
Age	
<40 years old	2 (27.27%)
≥ 40 years old	9 (72.73%)
Sex	
Male	3 (18.18%)
Female	8 (81.82%)
Position	
Headmaster	1 (9.09%)
Academic vice headmaster	1 (9.09%)
Sport teacher	2 (18.18%)
Subject teacher	7 (63.64%)

Source: Primary Data

Emerging Themes

Thematic analysis of the focus group discussion identified several key themes reflecting the implementation of the Balanced Nutrition Guidelines and the associated barriers:

Partial Implementation of Balanced Nutrition Guidelines

Vegetables and fruits: Most participants reported consuming only one type of vegetable per day. A common barrier was the lack of time for preparation.

"In one day, only one type of vegetable, at least that." – Teacher JM (49 years)

"There was limited time, so it's difficult to prepare vegetables." – Teacher MN (37 years)

Protein Intake: Participants commonly included tempeh or fish in meals, but preparation time was a limiting factor.

"At least there is fish or tempeh." – Teacher DN (41 years)

"Time and opportunity for preparing." – Teacher YI (49 years)

Staple Food Variety: Most teachers relied solely on rice as the staple food, citing limited time to diversify.

"We usually only consume rice." – Teacher AL (46 years)

"I don't have time to make a variety of staple foods." – Teacher LN (40 years)

Social Norms and Peer Influence

Sugary, Salty, and Fatty Foods: Although some teachers tried to reduce intake due to health reasons, they felt social pressure during shared meals.

"I've limited salty foods because I have a history of hypertension." – Teacher YL (49 years)
"If a friend brings fried snacks, it wouldn't feel right if we don't eat as well. It's a sense of solidarity." – Teacher AM (39 years)

Behavioral Habits and Health Priorities

Breakfast Habits: While some practiced regular breakfast, others skipped it due to lack of habit.
"I usually have breakfast before teaching." – Teacher YL (49 years)
"I don't usually have breakfast; it's just not a habit." – Teacher AY (42 years)

Water Intake: Participants reported drinking only when thirsty and consciously limiting intake to avoid frequent urination.
"If I am thirsty, I will drink." – Teacher DN (41 years)
"I avoid drinking too much because I do not want to urinate frequently." – Teacher DN (41 years)

Health Literacy and Label Use

Reading Food Labels: Teachers focused more on expiration dates and prices rather than nutrition information.
"We look at the expiration date first, then the price." – Teacher AM (39 years)
"We're used to seeing only the expiration date and price." – Teacher NI (43 years)

Physical Activity and Time Constraints

Activity Level: Physical activity was limited to incidental movement, and most reported no time for structured exercise.
"Work in the kitchen, walk from outside." – Teacher YL (49 years)
"There's no time for exercise." – Teacher JM (49 years)

These five themes reflect both the practical implementation and barriers faced by teachers in applying the Balanced Nutrition Guidelines. Each theme is interrelated and influenced by internal and external factors identified through thematic analysis. Figure 1 illustrates the thematic relationships between the five key findings from the focus group discussions and the three core components of the Self-Determination Theory (autonomy, competence, and relatedness).

The theme of partial implementation of balanced nutrition and lack of confidence in menu planning aligns with the competence construct, highlighting teachers' uncertainty and perceived skill limitations. Habitual eating behaviors and lack of control over food choices reflect challenges in autonomy, where teachers are constrained by schedules, school culture, or deeply rooted routines. Meanwhile, social influence and shared norms such as communal snacking and peer modelling demonstrate the role of relatedness in shaping food behavior.

This circular map demonstrates how teachers' practices and perceived barriers are interconnected through motivational and contextual influences. By visually mapping these dynamics onto SDT, Figure 1 enhances the interpretive clarity of the findings and provides a structured lens through which to understand the psychological mechanisms influencing teachers' dietary behavior.

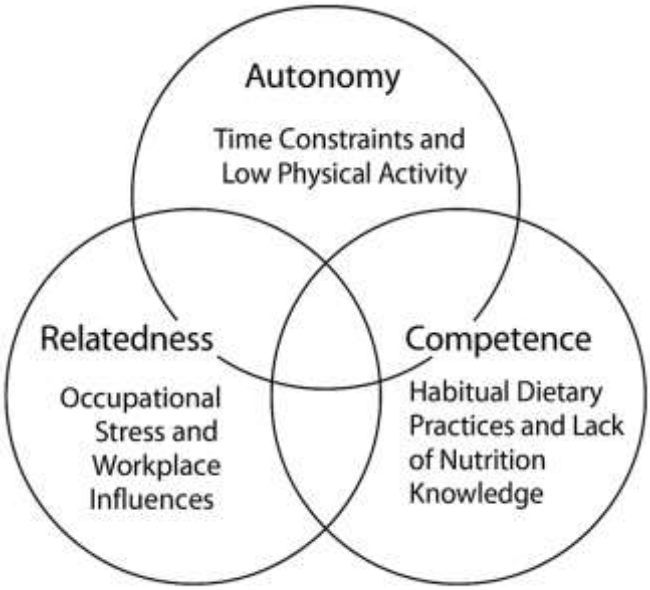

Figure 1. Circular Thematic Map of Teachers' Practices and Barriers in Implementing Balanced Nutrition Guidelines Interpreted through the Lens of Self-Determination Theory (SDT)

DISCUSSION

This study revealed that participants have not fully adopted the key messages of the balanced nutrition guidelines in their daily practices. Despite awareness of the guidelines, several internal and external barriers were identified that inhibit optimal implementation. These findings align with the principles of Self-Determination Theory (SDT), which suggests that behavior change is influenced by the interaction of motivation (intrinsic and extrinsic), autonomy, competence, and relatedness. Our study found that the lack of autonomy in food choices due to social and environmental constraints, limited competence in overcoming barriers, and social influences strongly affect the participants' adherence to balanced nutrition practices.

Limited Implementation of Balanced Nutrition Guidelines

The study showed that participants generally only consume one type of vegetable daily, mainly due to limited time for food preparation. This finding is consistent with (21) and (22), who identified similar barriers including time constraints, lack of accessibility, and affordability of vegetables and fruits. However, our study adds depth by situating these challenges within the Indonesian cultural context, where fresh vegetable preparation is time-consuming due to traditional cooking practices that often involve elaborate preparation steps and multiple dishes (23). This highlights how cultural food practices intersect with practical barriers. While previous studies primarily emphasize environmental barriers, our findings suggest the need to enhance individuals' perceived competence and intrinsic motivation, as postulated by SDT, by providing feasible strategies for integrating vegetable consumption into busy schedules.

Similarly, the consumption of protein-rich foods is limited among participants, who tend to rely mainly on tempeh. This again reflects Appleton assertion that preparation convenience plays a key role in protein food choices. However, our study contributes new insights by showing that plant-based proteins, despite being culturally familiar and affordable, are still underutilized due to perceived preparation burdens, underscoring the potential role of behavioral support interventions that foster autonomous motivation and competence in meal preparation (24).

Social Influence on Limiting Sugary, Salty, and Fatty Foods

Participants made efforts to reduce unhealthy food consumption; however, social dynamics within the workplace emerged as significant barriers. When offered unhealthy snacks by colleagues, participants felt compelled to consume them as a gesture of solidarity. This finding supports Clohessy et al. (2019), who emphasized that workplace food environments and social norms influence eating behaviors. However, unlike previous studies that mainly focused on environmental restructuring, our study underlines the importance of addressing relatedness needs as part of SDT, by promoting healthier social norms and creating supportive peer environments for healthy eating (25).

Hydration and Label Reading Practices

Participants did not meet recommendations for adequate water intake, commonly drinking only when thirsty, and avoiding drinking to minimize urination frequency. Neglecting hydration is often tied to busy routines and lack of access to hygienic water or facilities (26). Yet, our study found an additional psychological barrier: perceived inconvenience and habitual neglect, which could be addressed through motivational strategies that build internalized habits around hydration, aligning with the autonomy-supportive environment advocated by SDT.

Reading of food packaging labels was also minimal, with participants focusing more on expiration dates and prices rather than nutritional information. Barriers included a lack of perceived necessity and difficulties in understanding the information (27,28). Although participants were teachers with relatively high levels of education, the low use of nutrition labels may stem not only from habit but also from cognitive and perceptual barriers. These include limited confidence in interpreting technical nutritional content, low perceived relevance of the information, and mental overload when processing complex label data (29,30). This highlights that even among educated groups, effective label use requires more than knowledge it depends on internal motivation, self-efficacy, and environmental supports that align with SDT constructs of competence and autonomy.

Physical Activity: Time Constraints and Family Prioritization

Participants reported very limited engagement in physical activity, mainly due to work-related time constraints and the priority to spend remaining time with family. Previous study found similarly identified work demands and lack of safe environments as barriers to physical activity (31,32). Nevertheless, our study extends these findings by uncovering a neglected opportunity for integrating family-based physical activities, which could fulfill both the need for relatedness and support sustained behavior change, as proposed by SDT.

To synthesize the thematic findings within the theoretical lens, Figure 1 maps the emergent themes onto the three core components of Self-Determination Theory (SDT): autonomy, competence, and relatedness. For example, the theme of time constraints and limited meal variety reflects diminished competence; the normalization of consuming unhealthy snacks during social gatherings illustrates the influence of relatedness; and the absence of breakfast routines and hydration habits reveals challenges to autonomous regulation. This conceptual figure enhances interpretation by situating observed behaviors within the SDT motivational structure, offering a coherent explanation for the low adoption of nutrition guidelines among teachers.

While SDT provides valuable insights into the motivational drivers of behavior, incorporating the Socio-Ecological Model (SEM) further enriches our understanding by contextualizing these behaviors within broader social and environmental systems. Individual autonomy and competence are not only shaped by internal motivation, but also by interpersonal dynamics (e.g., peer influence), organizational culture (e.g., school norms), and policy-level supports (e.g., institutional food policies). Integrating SDT and SEM underscores the need for multidimensional interventions that enhance intrinsic motivation while also restructuring the social and environmental contexts in which dietary behaviors occur. Future studies may benefit from explicitly designing interventions that operate across multiple SEM levels, guided by SDT-informed motivational strategies (16).

Although this study was contextually grounded in the experiences of Indonesian school teachers, the findings may have broader analytical generalizability to other professional groups operating in structured institutional settings. Occupational groups such as healthcare professionals, civil servants, and office-based workers often share similar time-bound responsibilities, hierarchical organizational structures, and social norms that shape health-related behaviors (18,33). These parallels suggest that motivation-based strategies informed by SDT and enhanced by SEM

considerations may be applicable across diverse professional environments. Future research could test and refine these approaches in different occupational settings to support more inclusive and scalable health promotion interventions.

Contribution to New Understanding

Our findings contribute to the existing literature by offering a nuanced understanding of how balanced nutrition guidelines are not merely hindered by external environmental or practical barriers, but also by internal motivational deficits. By applying Self-Determination Theory as a conceptual lens, this study emphasizes the importance of fostering autonomy, competence, and relatedness in promoting dietary behavior change. This moves beyond traditional informational or environmental interventions by highlighting the need for autonomy-supportive environments, competence-building interventions, and social support systems in both workplace and family settings.

Study Limitations

This study has several limitations. First, the sample size was small and limited to schoolteachers within a specific urban setting, which may affect the transferability of the findings to other contexts or professions. Second, the data were collected only through focus group discussions, which may lead to social desirability bias, particularly in reporting personal practices. Future studies should consider mixed-method approaches and broader participant groups to enhance the trustworthiness and generalizability of the findings.

Recommendations for Future Research

Future research should also consider testing targeted intervention strategies such as nudging approaches (e.g., rearranging food options in school canteens), digital health interventions (e.g., mobile-based reminders or educational modules to support daily nutritional habits), and peer mentorship programs that leverage supportive networks among educators. These context-specific strategies may be more sustainable and effective in influencing teachers' behavior, given their tight schedules, social role modeling, and institutional constraints. Designing and evaluating such tailored approaches will be key to translating behavioral insights into impactful health promotion programs in school settings.

CONCLUSION

This study concludes that the participants' low implementation of balanced nutrition guidelines is not merely due to knowledge gaps, but is primarily driven by structural and motivational barriers, particularly the lack of time for meal preparation and limited internalization of balanced nutrition guidelines. By applying Self-Determination Theory (SDT) as the conceptual framework, the study found that the data largely support the theory, particularly in highlighting how deficits in autonomy, competence, and relatedness interact to hinder healthy eating behaviors. The theory was an adequate and valuable guide for understanding the complex interplay of personal, social, and environmental factors that influence participants' dietary practices.

However, while SDT helped elucidate key motivational aspects, its application was somewhat limited in capturing deeply ingrained cultural and systemic barriers, such as food preparation norms in the Indonesian context. This suggests that while SDT is useful, future studies should consider integrating socio-ecological perspectives to capture broader environmental and cultural determinants alongside motivational aspects.

In light of these findings, practical innovations are urgently needed in cooking and food processing methods to create time-efficient, culturally acceptable, and nutritionally balanced options. Additionally, interventions should not only provide knowledge but also foster environments that support autonomy, build competence, and create supportive social norms around healthy eating. For practice, integrating family and workplace-based interventions that promote easy meal preparation and positive social modeling is recommended. For future research, it is important to explore strategies that blend motivational and structural approaches, and to test these interventions in diverse settings and populations. For education, incorporating behavior change theories such as SDT into nutrition education curricula could enhance the effectiveness of dietary interventions by addressing both internal and external barriers.

These findings highlight the importance of developing school-based nutrition interventions and further research that address not only informational gaps but also the social and institutional contexts influencing teachers' dietary behaviors.

AUTHOR'S CONTRIBUTION STATEMENT

The contributions of each author are described as follows. NZ, NHD, RMT, and VH designed the study; NZ conducted FGD, and analysed result of FGD; All Authors contributed writing and reviewing the entire manuscript.

CONFLICTS OF INTEREST

The author declares no conflict of interest.

DECLARATION OF GENERATIVE AI AND AI-ASSISTED TECHNOLOGIES IN THE WRITING PROCESS

During the preparation of this manuscript, the authors used ChatGPT (OpenAI) to assist with language refinement and structure organization. The authors reviewed and edited the content as necessary, and take full responsibility for the integrity and accuracy of the manuscript

SOURCE OF FUNDING STATEMENTS

The authors received no specific grant from any funding agency in the public, commercial, or not for-profit sectors for the conduct of this research

ACKNOWLEDGMENTS

The authors would like to express their sincere gratitude to all participants who contributed to this study. Special thanks to the school management and teachers in Makassar City for their support and cooperation during the data collection process. The authors also acknowledge the assistance provided by colleagues and reviewers whose insights helped improve the quality of this manuscript.

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