

Understanding Minangkabau Culture and its Impact on Weight Management Strategies in Overweight and Obese Women: A Qualitative Study



Sri Dewi^{1,4}, Setyowati Setyowati², Imami Nur Rachmawati^{2,*} and Dian Ayubi³

¹Doctoral Program, Faculty of Nursing, University of Indonesia, Indonesia

²Department of Maternity Nursing, Faculty of Nursing, University of Indonesia, Indonesia

³Faculty of Public Health, University of Indonesia, Indonesia

⁴Department of Maternity Nursing, Health Ministry Polytechnic of Padang, Indonesia

Abstract:

Background: Overweight and obesity have a particular impact on women; thus, overweight and obese women need to modify their lifestyle in order to lose weight. Diet and exercise are part of the lifestyle influenced by the values of society.

Objective: This study aimed to explore the influence of Minangkabau cultural values on weight management strategies among obese women, aiming to identify culturally appropriate interventions.

Methods: The data were collected through Focus Group Discussions (FGDs) and semi-structured interviews between 35 overweight and obese women, two Minangkabau community leaders, and three health workers in Solok, West Sumatra Province, from June to December 2022. The data were analysed using a descriptive-qualitative approach with thematic content analysis and Coalizzi's method.

Results: Our analysis revealed three primary themes: eating habits being more desire-driven, less nutritious, and irregular; infrequent exercise due to physical and psychosocial barriers; and significant challenges in weight management due to social and cultural values.

Conclusion: The study highlights the profound influence of Minangkabau cultural values on diet and exercise habits among overweight and obese women, including foods containing coconut milk and fried foods served as the daily menu at home and traditional events; behavioural rules for women to dress without revealing their curves; the prohibition to exercise in public and walk alone; and the significance of obesity as a symbol of prosperity. There is a need for a strategy to encourage healthy diet and exercise habits in society in accordance with the Minangkabau cultural values for women. A support group consisting of numerous obese women, their families, and community leaders is also required.

Keywords: Diet, Exercise, Minangkabau community, Obesity, Weight management, Women.

© 2024 The Author(s). Published by Bentham Open.

This is an open access article distributed under the terms of the Creative Commons Attribution 4.0 International Public License (CC-BY 4.0), a copy of which is available at: <https://creativecommons.org/licenses/by/4.0/legalcode>. This license permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

*Address correspondence to this author at the Department of Maternity Nursing, Faculty of Nursing, University of Indonesia, Indonesia; E-mail: inrachma@ui.ac.id

Cite as: Dewi S, Setyowati S, Rachmawati I, Ayubi D. Understanding Minangkabau Culture and its Impact on Weight Management Strategies in Overweight and Obese Women: A Qualitative Study. Open Public Health J, 2024; 17: e18749445300276. <http://dx.doi.org/10.2174/0118749445300276240327053131>



CrossMark

Received: January 15, 2024

Revised: February 26, 2024

Accepted: February 27, 2024

Published: April 26, 2024



Send Orders for Reprints to
reprints@benthamscience.net

1. INTRODUCTION

Obesity is prevailing worldwide with significant health and economic impacts [1, 2]. The prevalence of obesity

worldwide increased from 34.8% in 2016 to 40% in 2019 [3, 4]. According to Basic Health Research (2018), obesity in Indonesia increased from 11.4% in 2014 to 21.8% in

2018 [5]. It has been reported to be more common in women (29-32%) than in men (14.5-25%) [6], and more prevalent in the early adult age range (18-29 years old), with a prevalence of roughly 27.2%-35.4% [4-6].

Obesity is a major risk factor for developing a spectrum of health complications, including cardiovascular diseases, like hypertension [7], hyperglycemia, type 2 diabetes [8], muscular disorders [9], respiratory conditions [10], a host of psychological problems [11], dyslipidemia, and an increased risk of certain cancers. These conditions underscore an urgent need for comprehensive weight management strategies that address both dietary and physical activity patterns. A recent study has highlighted the multifaceted impact of culture and social environments on health [12, 13], especially in obesity and weight management [14, 15]. Cultural norms related to food preparation, eating rituals [16], physical activity [17], and body image perceptions significantly influence shaping dietary behaviors and weight-related attitudes. Diet and exercise are, therefore, the two main factors contributing to obesity [17-21].

In Indonesia, cultural diversity across ethnic groups significantly affects behavior [22], [23]. Among these, the Minangkabau community of West Sumatra, Indonesia, has a rich cultural heritage that is highly linked to their food practices, social norms, and community traditions [24].

The Minangkabau is the world's largest matrilineal society primarily based in West Sumatra [22, 23]. Women hold an extremely high place in the Minangkabau society [24]. For this reason, *petatah* and *petitih* (proverbs) are important as they integrate all rules, provisions, regulations, and laws related to all aspects of social life and include an indirect meaning [25, 26].

In addition to behavioral standards, eating habits are also regulated in the Minangkabau culture [27]. Most Minangkabau foods contain fat and coconut milk, and this certainly influences the type of food consumed by the Minangkabau women [28], affecting their health and making them obese [29]. Thus, it is associated with a high prevalence of Low- and High-density Lipoprotein Cholesterol (LDL-C and HDL-C) levels, hypertension, and central obesity, affecting over 50% of the population [28]. This demonstrates the importance of a specific understanding of health promotion initiatives that adhere to the Minangkabau norms [28, 29].

The national movement program to prevent obesity has been carried out by the community health center, although its prevalence remains high [30]. Studies on Japanese-Brazilians show that alcohol consumption and an irregularly active lifestyle are associated with overweight and obesity [31]. Another study found that advice from healthcare providers becomes an important factor in a person's weight management [30]. Gusnedi [32] formulated Food-based Recommendations (FBRs) for Minangkabau women of reproductive age with dyslipidemia. Agustina [33] developed The EatsUp® mobile applications, such as personalized tracking tools and food choice aids, to enhance weight loss programs.

However, the program has been found to be ineffective in terms of lowering obesity.

The women have often been reported to find it challenging to stick to their dietary program as their lifestyle includes less nutritious and sweeter foods [34]. In addition, social issues and customs make it more difficult for them to avoid unhealthy foods and habits [35]. In the case of Minangkabau culture, obese women encounter additional challenges due to sociocultural factors, such as moral commitments, which affect their attitudes [12]. Despite this, there is limited literature that focuses on the experiences of weight management in Minangkabau culture from the obese women's perspective.

Based on the above description, this study attempted to fill the research gap by directly addressing the challenges faced by obese women in West Sumatra. While the majority of qualitative studies on obese women have been conducted in urban settings with higher standards of living, this study aimed to understand how the Minangkabau cultural values influence weight management in obese women in rural settings. By focusing on a rural setting, where traditional practices are most prevalent, this research offers new insights into the role of culture in health interventions, at a time when digital health innovations present novel opportunities for enhancing weight management programs.

In light of the escalating obesity epidemic and the potential of digital solutions to support culturally tailored health initiatives, our study sought to understand how Minangkabau cultural values influence weight management strategies. This research not only aimed to fill a critical gap by focusing on a unique cultural context, but also explore the timely integration of digital innovations in addressing obesity, marking a significant contribution to both academic research and practical health promotion efforts.

2. METHODS

This study employed a descriptive qualitative approach. A total of 40 participants participated in this study, consisting of 35 overweight and obese women and 5 community leaders. The participant profile can be seen in Table 1.

2.1. Research Design and Data Collection

This study was conducted at Solok, West Sumatra Province, from June to December 2022. The data were collected through Focus Group Discussions (FGDs) and semi-structured interviews. The interviews and FGDs were done at the participants' convenience online through Zoom due to face-to-face restriction regulations during the COVID-19 pandemic period.

The research team consisted of active university faculty members (SW, INR, and DA) and a research student (SD). Four of the five researchers were women. All have had experience or training in qualitative research methods. Participants were interviewed by SD using semi-structured questions about weight loss efforts, perceived challenges, and Minangkabau culture related to diet and exercise habits. Data collection was stopped when saturation was reached.

Table 1. Participant profile.

Profile	Frequency	Percentage (%)
Occupation	-	-
Student	16	40.00%
College student	10	25.00%
Private employee	8	20.0%
Housewife	5	12.50%
Education Level	-	-
Junior high school	7	17.50%
Senior high school	24	60.00%
Bachelor degree	8	20.00%
Post-graduate degree	1	2.50%
Marital Status	-	-
Single	30	75.00%
Married	10	25.00%

The data were analyzed using thematic content analysis by employing Colaizzi's strategy [36]. The data analysis stages included data collection, data transcription, data coding, and identification of processes and conceptual patterns. In order to improve the data reliability, a second coder, especially a supervisor/facilitator being a qualitative research expert, was hired. The transcription of data coded was then grouped into categories (open coding). These categories constituted sub-themes providing meaning, significance, and boundaries. The themes consisted of related sub-themes. Further, the emerging themes and categories were identified and clarified to see whether they answered the objectives of the study. The themes constructed in an integrated manner were then entirely, systematically, and clearly described.

Finally, the data were then compared to the results of interviews with the community leaders and health workers. This study attempted to increase the data validity and reduce bias by using the triangulation method. It was carried out through interviews, FGDs, and observations. Participants with diverse characteristics (junior high school students, high school students, university students, single working women, and married women) were also involved.

2.2. Data Validity and Reliability

This study prioritized the aspects of validity and reliability during the process of data collection, analysis, and presentation. In this study, the data validity was maintained by using a purposive sampling method and confirming the research findings to the participants. Meanwhile, the data reliability was ensured by involving all researchers to analyse the data objectively and conducting an audit process by external reviewers to examine the research data and documentation. Further, this study also implemented a confirmability process where the researchers confirmed the research results with the participants to compare the results obtained with the participants' experiences. In addition, this study's transferability illustrated that the results of this study could be generalized to obese women with similar cultural

values despite living in different parts of Indonesia.

2.3. Ethical Considerations

This research was approved by the Faculty of Nursing Ethics Committee, University of Indonesia, number KET64/UN2.F12.D1.2.1/PPM.00.02/2022, in accordance with the Declaration of Helsinki. All participants were informed about the research before providing informed consent. Informed consent was signed by all participants. The researchers allowed the participants to refuse or withdraw from the research with no consequences. The researchers maintained the confidentiality of the participants' identities by keeping them anonymous and using a code as the identity in the transcript. The data were saved on a secure drive that only the researchers had access to.

3. RESULTS

3.1. Theme Analysis

Three themes emerged from the data: eating habits being more desire-driven, less nutritious, and irregular; not exercising frequently due to physical and psychosocial issues; and challenges in weight loss due to social and cultural values. The themes are detailed below.

3.1.1. Theme 1: Eating Habits being more Desire-driven, Less Nutritious, and Irregular

Theme 1 consisted of three categories, including [1] desire-driven and less nutritious foods [2], irregular eating habits, and [3] foods containing coconut milk and fried foods as the daily menu at home.

3.1.1.1. Desire-driven and Less Nutritious Foods

A total of 13 participants confirmed that they snacked on fried foods and sweet drinks in between meals. In addition, 16 participants preferred junk food. 7 participants also did not like eating vegetables, and 4 participants rarely ate fruits. They stated that:

"...If I am too lazy to cook or if I have work to do and have no time to cook, I usually order junk food..." (P28).

"...I frequently consume sweet drinks. Despite eating

fewer meals, I eat more snacks. I rarely eat vegetables and only eat fruits twice a week. I am sometimes too lazy to peel the fruits and let them rot in the refrigerator by accident..." (P35).

"...I eat meals with rice three times a day, and only eat vegetables once. I would not eat the vegetables if I did not like it. I eat the vegetables no more than three times a week..." (P3).

The health workers also confirmed that adolescents often consumed savory and sweet foods. They stated that:

"...Today's adolescents prefer fast foods to healthy foods. They also love sweet drinks loaded with artificial sweeteners and colors, which are bad for their health..." (Health worker 2).

Therefore, it could be concluded that there might be many shops selling sweet drinks in the Minangkabau neighbourhood.

3.1.1.2. Irregular Eating Habits

The participants lowered their frequency of eating rice by skipping breakfast, eating only two meals a day, and avoiding dinner. There were 16 participants who rarely ate breakfast, bought snacks at school or work, and limited their rice consumption to once a day. They stated that:

"... I almost never have breakfast. I eat at the cafeteria during breaks, and after that, I will have snacks like fried foods. When I come home from school, I eat again. After that, I do not eat until the evening..." (P16).

"...I eat rice once a day, and sometimes it is irregular..." (P23).

3.1.1.3. Foods Containing Coconut Milk and Fried Foods Served as the Daily Menu at Home

There were 8 participants who consumed foods containing coconut milk every day. Other participants claimed that they consumed foods containing coconut milk three to four times a week. Further, 10 participants also confirmed that fried foods were served as a daily menu at their home. *Gulai* or curry was the most common food containing coconut milk eaten by the Minangkabau people. They stated that:

"...The curry is cooked until it is thick and oily, and it can be stored for 2 days. We usually cook it three to four times a week..." (P32).

"...My mom at home loves cooking the Minangkabau food. She cooks foods with coconut milk twice a week, and most of the time, she makes fried foods." (P18).

"...My mom also makes chilli sauce at home. She cooks one fried food and one curry every day..." (P11).

The community leaders claimed that cooking coconut milk dishes heavily improved their flavor. The availability of tools and raw ingredients, as well as the easiness of obtaining coconut milk from the shops near the participants' houses, made the coconut milk frequently used in the majority of food preparation. The community leaders and health workers stated that:

"...We make curry with coconut milk from two coconuts. We love the sauce to be thick and delicious..." (Community leader 1).

"...We use any food ingredients with coconut milk. It is because coconut, as the raw ingredient for coconut milk, is always available in every house..." (Health worker 2).

"...There is a shop near my house that sells freshly squeezed coconut milk. It makes the cooking easier, and they also sell spices, crushed chillies, and coconut milk..." (Health worker 3).

Based on the field observations, it was discovered there were many coconut trees growing around the neighbourhood. They could be harvested in huge amounts at particular times of the year.

3.1.2. Theme 2: Not Exercising Frequently due to Physical and Psychosocial Issues

Theme 2 consisted of two categories: (1) physical issues and (2) psychosocial issues.

3.1.2.1. Physical Issues

There were 14 participants who claimed that they did not exercise because they felt weak, exhausted from work, had bodily aches after exercises, or felt heavy. They stated that:

"...I often feel weak and I am now overweight..." (P35).

"...I do not exercise due to active work, such as washing and teaching..." (P27).

"...I am too lazy to move because my body is heavy and all I want is to sit and lie down..." (P16).

3.1.2.2. Psychosocial Issues

There were 7 participants who reported that being seen exercising outside their house made them feel uncomfortable and embarrassed, and that their friends were ignoring them. They stated that:

"...When we are at home, we usually jog around our neighbourhood. I feel uncomfortable and there are many vehicles on the road. I feel seen and embarrassed..." (P27).

"...I have no friends to exercise with..." (P2).

This was supported by a community leader, whose statement is as follows:

"...Today's community do not exercise often, have no activity, mostly spend a lot of time scrolling on their phones, sleep late, and wake up late..." (Community leader 3).

3.1.3. Theme 3: Challenges in Weight Loss due to Social and Cultural Values

Theme 3 consisted of four categories, namely (1) no facility to exercise, (2) behavioural rules for women, (3) foods at traditional events, and (4) the significance of obesity as a symbol of prosperity.

3.1.3.1. No Facility for Exercise

There were 4 participants who stated that there was no facility to exercise outside their house, such as a

designated area for morning jogging and gymnastics. The other 4 participants stated that they do not participate in gymnastics at the community health center since it is too far away from their house and they do not have any personal vehicle. They stated that:

"...I used to have a vehicle, but I no longer have it. I also do not have any sports equipment at my house..." (P8).

"...When I was in the university, I could go jogging frequently since my university had a jogging field and the track was carefully designed so that we did not jog alone. Thus, the exercise was fun if we did it together with friends..." (P27).

3.1.3.2. Behavioral Rules for Women

The behavioral rules for women, especially the Minangkabau women, included not wearing anything revealing their curves, not exercising in public, and not walking alone. As a result, not exercising had become a habit. They stated that:

"...Exercising appears to be rarely done in the family or the extended family..." (P27).

The community leaders stated that the role of *Bundo kanduang* (married women) is to communicate and maintain the cultural values in the community so that the Minangkabau traditional rules are well-maintained. They expressed the following:

"...The Bundo kanduang teaches the community norms, speech etiquette, and how to dress and walk..." (Community leader 1).

"...The women should not dress revealing their curves. It is considered inappropriate among the Minangkabau community. The fathers and uncles will feel offended since many people will claim that their educated daughters/nieces fail to adhere to the traditional rules..." (Community leader 2).

"...The women should not exercise in public. It is as if they are showing their body movements to the public; instead, the women should choose a place where no one can see them exercising..." (Community leader 2).

"...Single women are not permitted to leave the house unaccompanied. If they do not have any friends to exercise with, they should stay at their house..." (Community leader 2).

A community leader stated the women in Minangkabau historically do not participate in specific sports because they were already tired of doing housework.

"...A mother's responsibilities extend beyond sports activities. As a result, there is no need to exercise outside the house for the fear of embarrassing their mothers or brothers..." (Community leader 2).

3.1.3.3. Foods at Traditional Events

The community leaders stated the food at traditional events as compulsory. The *Bundo kanduang* (married women) had passed down the traditional food preparation for generations. The participants reported that eating

during the traditional events is mostly done at night. This typical practice begins at 8 pm and lasts until 3 am.

"...The traditional events last until late at night, leaving our body exhausted in the morning..." (Community leader 1).

The participants reported that rice meals are the main menu at the traditional events. They are served with various specific side dishes (*samba kapalo adat*). These side dishes are either fried or made with coconut milk. After eating the rice meals, they are served with cakes or snacks, the majority of which are sweet (*parabuang*). The community leaders stated that:

"...Chicken meals are so valuable that they create a sense of pride when served, as they are high-quality food..." (Community leader 2).

"...The food served at the traditional events is cooked with coconut milk and is high in cholesterol..." (Community leader 1).

Furthermore, the community leaders also explained that there is a guideline for eating at traditional events, such as taking the closest food and avoiding the one that is difficult to reach. They stated:

"...We are only allowed to take the closest food, and if we want to take the one which is far away, we must ask someone else to take it and we cannot take it ourselves..." (Community leader 2).

3.1.3.4. The Significance of Obesity as a Symbol of Prosperity

According to community leaders, obese individuals are prosperous because they have enough money and can afford to eat great foods. Besides, they also demonstrated that they are free of stress, have a lot of patience, and laugh a lot. Furthermore, it was reported that they also believe that there is no need to diet and it is not important to consider the consequences. The participants stated the following:

"...In the community, the obese individuals are considered prosperous and have a lot of money. They have no stress, are patient, and can easily laugh..." (Community leader 1).

"...I believe that there have been efforts to prevent obesity in general. However, there are psychological factors influencing an individual's intention to do it. Some people suggest to continue eating well and not to worry about the consequences..." (Health worker 3).

4. DISCUSSION

The findings of this study confirm the Minangkabau culture to influence obese women's weight loss efforts. This culture involves eating foods containing coconut milk as a daily menu at the house and at traditional events, and there are specific behavioural rules for women. The results are elaborated as follows:

4.1. Eating Habits being more Desire-driven, Less Nutritious, and Irregular

This study has found the participants' eating habits to include limiting the frequency of eating rice by skipping

breakfast, eating only twice a day, and skipping dinner. These findings are consistent with the findings of Agustina (2020), who discovered that not eating dinner is more common than not eating breakfast among teenagers in Indonesia [37].

Despite the efforts to limit the eating frequency, the types of food mostly consumed by the participants were unhealthy, such as junk food, fried meals, and sweet drinks, which were also easily found in their neighbourhood. Similarly, Anianwu (2023) found eating out, eating fast food, and eating poorly processed food to all contribute to obesity [38].

Current weight-management recommendations emphasize the importance of healthy eating habits that include eating a variety of nutrient-dense foods, limiting eating portions, and lowering the overall energy density [39]. However, it has also been found that obese women rarely consume vegetables and fruits, and prefer only particular types of vegetables and fruits. This is consistent with a study by Widjaja (2020) and Prihaningtyas (2020) on teenagers, which found obese teenagers to consume less fruits and more fried foods [40, 41].

Additionally, the community's vegetable and fruit consumption was significantly lower than that recommended by the Indonesian dietary guidelines [29]. This finding is in line with a study by Deswita (2011) on obese adolescents in Padang, which found the adolescents eating poorly processed foods to have a 14.1 times higher chance of obesity than those eating properly [18].

In addition, the results of this study show almost all foods to be processed with coconut milk or fried on a daily basis at home in the Minangkabau culture. This finding is consistent with Gusnedi (2019) and Azima (2016), who found Minangkabau people to consume fat mainly in the form of cooking oil and coconut milk [29, 42], demonstrating the importance of including the family and community in efforts to improve the eating habits [43].

4.2. Not Exercising Frequently due to Physical and Psychosocial Issues

The obese women's physical and psychosocial issues drove them to skip exercising and believe that doing housework is the replacement. Several participants mistook doing the housework for exercise, claiming that both the housework and office work exhausted them, leaving them with no energy or time to exercise. The results of this study are consistent with the findings of Baillot *et al.*, who discovered the reasons for not engaging in physical activities to be a lack of self-discipline/motivation, pain or bodily discomfort, and a lack of time [44]. Besides, the obese women reported that exercising outside their house was not a habit in their families or communities. This finding is in line with a study by Irandoost *et al.* (2023) in the Kurdish region of Iran on misunderstandings about exercise, considered as pointless and a waste of time [21].

Furthermore, the psychological influence of how others evaluated single obese women, particularly

adolescents, is such an intriguing finding of this study. This finding explains married women to have psychological problems as a result of internal bodily problems, such as clothes that no longer fit, whereas single women to have psychological problems as a result of social judgment. A previous research indicated the married Minangkabau women to have the strength and security of welfare, thus being less concerned about their body form and beauty [18].

4.3. Challenges in Weight Loss due to Social and Cultural Values

The participants of this study reported no particular workout facilities, such as a bicycle or sports equipment at their house. The lack of public sports facilities, such as designated spaces for morning running and gymnastics, was a challenge to exercise for obese women. The findings of this study are consistent with those of Singh (2022), who discovered that women needed a separate area to maintain their privacy, which would encourage females of all ages to participate in sports and be physically active [14].

Further, obese women were reported to often have difficulties engaging in physical activities outside the home since they are embarrassed to wear tight sportswear in public. This is in compliance with the Minangkabau culture, in which the women spend the majority of their time indoors [18]. Dressing standards have also been reported to be strictly enforced in the Minangkabau culture in order to avoid wearing clothing that is too tight [45]. This leads obese women to prefer exercising inside rather than outside [46]. Past studies have also found social norms and culture to be the two common barriers to women's active participation in physical activities [14, 47].

This study has also observed a culture of processing food with coconut milk or frying it in the daily menu at the house and traditional events. This finding is consistent with prior research studies, which have found the Minangkabau people to mostly consume fat in the form of cooking oil and coconut milk [29, 42]. The food that had been processed with coconut milk and fried might include more calories. The Minangkabau obese women were actually aware that the coconut milk and high-fat foods were unhealthy for their bodies, but it was difficult for them to exclude them from their regular diet [29]. For this reason, it is deemed important for obese women to be educated about the difference in meal calories when cooked with and without coconut milk.

The rising availability of sweet drinks, ice cream, coffee drinks, fast food, and high-fat meals served on the street has created a new culture among young people to shop for food throughout the day, particularly in the afternoon and evening [48].

The community's perception of married women was that if they are overweight, it means that they are free of stress, have a lot of patience, and can laugh easily. This is consistent with the study of Irandoost (2023) that obese individuals are more recognized and accepted in Kurdish society because the majority of males consider obesity as

one of the most attractive features of women [21]. The married obese women's drive to change their lifestyle in order to become healthier was thus influenced by the community's acceptance of them.

The study has attained a unique finding that single obese women face psychological problems as a result of their friends insulting them about their physical size, whereas the community perceives obesity in married women as a sign of success. These findings also highlight a more comprehensive strategy for married women to have strong motivation to lose weight, although their social environment does not care. The study by Yin Lau [49] evaluated the effectiveness of personalised eHealth interventions in reducing body weight with a combination of tailored content and customised feedback, usage of theoretical basis, short message service, device, reminder, self-monitoring, goal setting, and synchronous communication for 12 to 14 weeks.

The results of this study demonstrated researching the Minangkabau community as necessary to ensure that when people of a certain culture are faced with certain problems, differences in problem-solving procedures relevant to that culture can be evidenced [50]. Further, all health workers can consider the problems described in this study to determine appropriate solutions for overcoming obesity issues [51].

Although this study has been conducted in West Sumatra, it can be generalized to obese women with similar cultural values in different regions of Indonesia. However, this study involves a major limitation. This study was only limited to the participants' perceptions, and did not include their family members and peers to deepen the discussion. This study underlines that social support is important for obese women. Therefore, future researches are suggested to involve the obese women's family members and peers as the participants of the study.

CONCLUSION

The Minangkabau values and culture have been found to be influential with respect to the eating and exercise habits of obese women in this study. Our findings have identified specific values, including foods containing coconut milk and fried foods served as the daily menu at home and traditional events; the existence of behavioural rules for women to dress without revealing their curves; the prohibition of exercising in public and walking alone; and the significance of obesity as a symbol of prosperity.

Therefore, it is necessary to promote a healthy diet and exercise in the community that is in accordance with the behavioural rules for the Minangkabau women. In addition, there must be a support group consisting of several obese women, families, and community leaders. We, however, acknowledge that there are some limitations in this study, such as potential cultural nuances that may not have been fully captured. To address these limitations and further advance understanding in this area, we recommend conducting longitudinal studies to explore additional cultural factors influencing health behaviors in future research.

ETHICS APPROVAL AND CONSENT TO PARTICIPATE

This research was approved by the Faculty of Nursing Ethics Committee, University of Indonesia, number KET64/UN2.F12.D1.2.1/PPM.00.02/2022.

HUMAN AND ANIMAL RIGHTS

No animals were used in this research. All procedures performed in studies involving human participants were in accordance with the ethical standards of institutional and/or research committee, and with the 1975 Declaration of Helsinki, as revised in 2013

CONSENT FOR PUBLICATION

All participants were informed about the research purpose before they provided the informed consent. Informed consent was signed by all participants.

STANDARDS OF REPORTING

STROBE guidelines were followed.

AVAILABILITY OF DATA AND MATERIALS

The data and supportive information are available within the article.

FUNDING

University of Indonesia funded this research through the postgraduate scheme international indexed publication with number NKB-091/UN2.RST/HKP.05.00/2022.

CONFLICT OF INTEREST

The authors declare no conflict of interest, financial or otherwise.

ACKNOWLEDGEMENTS

The researchers would like to thank the participants for volunteering and sharing their experiences during the discussions.

REFERENCES

- [1] Lin X, Li H. Obesity: Epidemiology, pathophysiology, and therapeutics. *Front Endocrinol* 2021; 12(September): 706978. <http://dx.doi.org/10.3389/fendo.2021.706978> PMID: 34552557
- [2] Okunogbe A, Nugent R, Spencer G, Ralston J, Wilding J. Economic impacts of overweight and obesity: Current and future estimates for eight countries. *BMJ Glob Heal* 2021; 6(10): e006351.
- [3] Chrysoula Boutari CSM A. A 2022 update on the epidemiology of obesity and a call to action: As its twin COVID-19 pandemic appears to be receding, the obesity and dysmetabolism pandemic continues to rage on. *Metabolism* 2022; 133: 155217.
- [4] Zhang L, Wang Z, Wang X, *et al.* Prevalence of overweight and obesity in China: Results from a cross-sectional study of 441 thousand adults, 2012-2015. *Obes Res Clin Pract* 2020; 14(2): 119-26. <http://dx.doi.org/10.1016/j.orcp.2020.02.005> PMID: 32139330
- [5] Nurwanti E, Hadi H, Chang JS, *et al.* Rural-urban differences in dietary behavior and obesity: Results of the riskesdas study in 10-18-year-old Indonesian children and adolescents. *Nutrients* 2019; 11(11): 2813. <http://dx.doi.org/10.3390/nu11112813> PMID: 31752101
- [6] The Main Results of Riskesdas 2018. Ministry of Health 2018.
- [7] Michałowska J, Miller-Kasprzak E, Bogdański P. Incretin

- hormones in obesity and related cardiometabolic disorders: The clinical perspective. *Nutrients* 2021; 13(2): 351.
<http://dx.doi.org/10.3390/nu13020351> PMID: 33503878
- [8] Agyemang C, Meeks K, Beune E, *et al.* Obesity and type 2 diabetes in sub-Saharan Africans – Is the burden in today's Africa similar to African migrants in Europe? The RODAM study. *BMC Med* 2016; 14(1): 166.
<http://dx.doi.org/10.1186/s12916-016-0709-0> PMID: 27769239
 - [9] Billich N, Adams J, Carroll K, *et al.* The relationship between obesity and clinical outcomes in young people with duchenne muscular dystrophy. *Nutrients* 2022; 14(16): 3304.
<http://dx.doi.org/10.3390/nu14163304> PMID: 36014811
 - [10] Mafort TT, Rufino R, Costa CH, Lopes AJ. Obesity: Systemic and pulmonary complications, biochemical abnormalities, and impairment of lung function. *Multidiscip Respir Med* 2016; 11(1): 28.
<http://dx.doi.org/10.1186/s40248-016-0066-z> PMID: 27408717
 - [11] Kim S, Kim SY. LONG-TERM impact of psychological factors and social interactions on obesity of female nationals in the United Arab Emirates. *Obesity* 2022; 30(10): 2079-88.
<http://dx.doi.org/10.1002/oby.23534> PMID: 36150209
 - [12] Peshkovskaya A, Bokhan N, Mandel A, Badyrgy I. Alcohol use and resilience among the indigenous tuvinians of Siberia. In: Danto D, Zangeneh M, Eds. *Indigenous knowledge and mental health*. Cham: Springer 2022.
http://dx.doi.org/10.1007/978-3-030-71346-1_10
 - [13] Peshkovskaya A, Galkin S. Health behavior in Russia during the COVID-19 pandemic. *Front Public Health* 2023; 11(October): 1276291.
<http://dx.doi.org/10.3389/fpubh.2023.1276291> PMID: 37849726
 - [14] Singh KN, Sendall MC, Crane P. Understanding sociocultural influences on physical activity in relation to overweight and obesity in a rural indigenous community of fiji islands. *J Racial Ethn Heal Disparities*. 2022; 10: pp. (3): 1508-17.
<http://dx.doi.org/10.1007/s40615-022-01336-0>
 - [15] Playdon M, Rogers TN, Brooks E, *et al.* Sociocultural influences on dietary behavior and meal timing among native hawaiian and pacific islander women at risk of endometrial cancer: A qualitative investigation. *Cancer Causes Control* 2023; 34(1): 23-37.
<http://dx.doi.org/10.1007/s10552-022-01628-0> PMID: 36208351
 - [16] Hall KD, Farooqi IS, Friedman JM, *et al.* The energy balance model of obesity: Beyond calories in, calories out. *Am J Clin Nutr* 2022; 115(5): 1243-54.
<http://dx.doi.org/10.1093/ajcn/nqac031> PMID: 35134825
 - [17] Masood B, Moorthy M. Causes of obesity: A review. *Clin Med* 2023; 23(4): 284-91.
<http://dx.doi.org/10.7861/clinmed.2023-0168> PMID: 37524429
 - [18] Deswita D, Lipoeto N, Mudjiran M, Abdullah KB. Relationship of eating behavior, knowledge, attitudes, physical activities, and parent support with obesity events in adolescents in Padang city. *Open Access Maced J Med Sci* 2021; 9(E): 999-1004.
<http://dx.doi.org/10.3889/oamjms.2021.5740>
 - [19] Andriyani FD, Biddle SJH, Priambadha AA, Thomas G, De Cocker K. Physical activity and sedentary behaviour of female adolescents in Indonesia: A multi-method study on duration, pattern and context. *J Exerc Sci Fit* 2022; 20(2): 128-39.
<http://dx.doi.org/10.1016/j.jesf.2022.02.002> PMID: 35308068
 - [20] Islam MR, Trenholm J, Rahman A. Sociocultural influences on dietary practices and physical activity behaviors of rural adolescents-a qualitative exploration. *Nutrients* 2017; 11(12): 2916.
<http://dx.doi.org/10.3390/nu11122916> PMID: 31810284
 - [21] Irandoost SF, Bayangani B, Dehdari T, *et al.* Exploring the causes of obesity among adults in the kurdish regions of Iran: A qualitative study. *Community Health Equity Research & Policy* 2023; 43(2): 183-93.
<http://dx.doi.org/10.1177/0272684X211006607> PMID: 33832372
 - [22] Sebastian A. Matrilineal practices among muslims: An ethnographic study of the Minangkabau of West Sumatra. *Ethnography* 2022; 0(0)
<http://dx.doi.org/10.1177/14661381221147137>
 - [23] Nurdin Z, Tegnan H. Legal certainty in the management of agricultural land pawning in the matrilineal Minangkabau society, West Sumatra. *Land (Basel)* 2019; 8(8): 117.
<http://dx.doi.org/10.3390/land8080117>
 - [24] Hakam A. Contested gender roles and relations in matriarchal minangkabau. *Muqoddima J Pemikir dan Ris Sociol* 2021; 2(1): 37-46.
<http://dx.doi.org/10.47776/MJPRS.002.01.03>
 - [25] Moeis I, Febriani R, Sandra I, Pabbajah M. Intercultural values in local wisdom: A global treasure of Minangkabau ethnic in Indonesia. *Cogent Arts Humanit* 2022; 9(1): 2116841. [Internet].
<http://dx.doi.org/10.1080/23311983.2022.2116841>
 - [26] Syofiani FH. The actualization of character values in sumbang duo baleh by teacher training and education students. *IRJE Indones Res J Educ* 2022; 6(2): 431-44.
 - [27] Mardatillah A. The enterprise culture heritage of Minangkabau cuisine, West Sumatra of Indonesia as a source of sustainable competitive advantage. *J Ethn Foods* 2020; 7(1): 34.
<http://dx.doi.org/10.1186/s42779-020-00059-z>
 - [28] Gusnedi G, Fahmida U, Witjaksono F, *et al.* Effectiveness of optimized food-based recommendation promotion to improve nutritional status and lipid profiles among Minangkabau women with dyslipidemia: A cluster-randomized trial. *BMC Public Health* 2022; 22(1): 21.
<http://dx.doi.org/10.1186/s12889-021-12462-5> PMID: 34991541
 - [29] Gusnedi G, Fahmida U, Djuwita R, Witjaksono F, Abdullah M. Food-based recommendations for Minangkabau women of reproductive age with dyslipidemia. *Asia Pac J Clin Nutr* 2019; 28(2): 310-20.
 PMID: 31192560
 - [30] Friese C, Yang JM-VK. Impact of weight-related advice from healthcare professionals on body mass index of patients in the USA. *Physiol Behav* 2019; 46(2): 248-56.
 - [31] Back IR, Oliveira RR, Silva ES, Marcon SS. Risk factors associated with overweight and obesity in Japanese-Brazilians. *J Nutr Metab* 2018; 2018: 5756726.
 - [32] Gusnedi AM, Abdullah M, Witjaksono F, *et al.* Promotion of optimized food-based recommendations to improve dietary practices and nutrient intakes among Minangkabau women of reproductive age with dyslipidemia. *Asia Pac J Clin Nutr* 2020; 29(2): 334-47.
 PMID: 32674241
 - [33] Agustina R, Febriyanti E, Putri M, *et al.* Development and preliminary validity of an Indonesian mobile application for a balanced and sustainable diet for obesity management. *BMC Public Health* 2022; 22(1): 1221.
<http://dx.doi.org/10.1186/s12889-022-13579-x> PMID: 35725407
 - [34] Bhanbhro S, Kamal T, Diyo RW, Lipoeto NI, Soltani H. Factors affecting maternal nutrition and health: A qualitative study in a matrilineal community in Indonesia. *PLoS One* 2020; 15(6): e0234545.
<http://dx.doi.org/10.1371/journal.pone.0234545> PMID: 32544180
 - [35] Kunto YS, Bras H. Ethnic group differences in dietary diversity of school-aged children in Indonesia: The roles of gender and household SES. *Food Nutr Bull* 2019; 40(2): 182-201.
<http://dx.doi.org/10.1177/0379572119842993> PMID: 31046454
 - [36] De Chesnay M. *Nursing research using data analysis. Qualitative Designs and Methods - Qualitative designs and methods in nursing*. Springer Publishing 2015.
 - [37] Agustina R, Nadiya K, Andini EA, *et al.* Associations of meal patterning, dietary quality and diversity with anemia and overweight-obesity among Indonesian school-going adolescent girls in West Java. *PLoS One* 2020; 15(4): e0231519.
<http://dx.doi.org/10.1371/journal.pone.0231519> PMID: 32324775
 - [38] Anyanwu OA, Naumova EN, Chomitz VR, *et al.* The socio-ecological context of the nutrition transition in Indonesia: A qualitative investigation of perspectives from multi-disciplinary stakeholders. *Nutrients* 2022; 15(1): 25.
<http://dx.doi.org/10.3390/nu15010025> PMID: 36615684

- [39] Smethers AD, Rolls BJ. Dietary management of obesity. *Med Clin North Am* 2018; 102(1): 107-24.
<http://dx.doi.org/10.1016/j.mcna.2017.08.009> PMID: 29156179
- [40] Widjaja NA, Prihaningtyas RA. Determinants of food choice in obesity. *IJPH* 2020; 15(1): 122-32.
<http://dx.doi.org/10.20473/ijph.v15i1.2020.122-132>
- [41] Hafizah D, Budiman Hakim D, Nurmalina R. Analysing food consumption in Indonesia. *Int J Progress Sci Technol* 2020; 20(2): 340-7.
- [42] Azima F, Rini , Novelina . Chemical characteristic and fatty acid profile in rendang Minangkabau. *Int J Adv Sci Eng Inf Technol* 2016; 6(4): 465-8.
<http://dx.doi.org/10.18517/ijaseit.6.4.712>
- [43] Andriani H, Friska E, Arsyi M, Sutrisno AE, Waits A, Rahmawati ND. A multilevel analysis of the triple burden of malnutrition in Indonesia: Trends and determinants from repeated cross-sectional surveys. *BMC Public Health* 2023; 23(1): 1836.
<http://dx.doi.org/10.1186/s12889-023-16728-y> PMID: 37735644
- [44] Baillet A, Chenail S, Barros Polita N, *et al.* Physical activity motives, barriers, and preferences in people with obesity: A systematic review. *PLoS One* 2021; 16(6): e0253114.
<http://dx.doi.org/10.1371/journal.pone.0253114> PMID: 34161372
- [45] Asniah . Acculturation of islam and traditional law: An experience of minangkabau, Indonesia. *Al-Adyan J Interfaith Stud* 2020; 8(1): 131-60.
- [46] Aziz E, Dzofir M, Widodo A. The acculturation of islam and customary law: An experience of Minangkabau, Indonesia. *Qudus Int J Islamic Stud* 2020; 8(1): 131-60.
<http://dx.doi.org/10.21043/qijis.v8i1.7197>
- [47] Balhareth A, Jafer M, Borgh-Sleddens E, Kremers S, Meertens R. Determinants of weight-related behaviors in male saudi university students: A qualitative approach using focus group discussions. *Int J Environ Res Public Health* 2021; 18(7): 3697.
<http://dx.doi.org/10.3390/ijerph18073697> PMID: 33916237
- [48] Murni IK, Sulistyoningrum DC, Susilowati R, Julia M, Dickinson KM. The association between dietary intake and cardiometabolic risk factors among obese adolescents in Indonesia. *BMC Pediatr* 2022; 22(1): 273.
<http://dx.doi.org/10.1186/s12887-022-03341-y> PMID: 35549677
- [49] Lau Y, Guang D, Chee H, Chow XP, Cheng LJ, Wong SN. Personalised eHealth interventions in adults with overweight and obesity: A systematic review and meta-analysis of randomised controlled trials *Prev Med* 2020; 132: 106001.
<http://dx.doi.org/10.1016/j.ypmed.2020.106001>
- [50] Stefani S, Ngatidjan S, Paotiana M, Sitompul KA, Abdullah M, Sulistianingsih DP. Dietary quality of predominantly traditional diets is associated with blood glucose profiles, but not with total fecal Bifidobacterium in Indonesian women. *PLoS One* 2018; 13(12): e0208815.
<http://dx.doi.org/10.1371/journal.pone.0208815>
- [51] Mirkarimi K, Kabir MJ, Honarvar MR, Ozouni-Davaji RB, Eri M. Effect of motivational interviewing on weight efficacy lifestyle among women with overweight and obesity: A randomized controlled trial. *Iran J Med Sci* 2017; 42(2): 187-93. PMID: 28360445

DISCLAIMER: The above article has been published, as is, ahead-of-print, to provide early visibility but is not the final version. Major publication processes like copyediting, proofing, typesetting and further review are still to be done and may lead to changes in the final published version, if it is eventually published. All legal disclaimers that apply to the final published article also apply to this ahead-of-print version.