

Health Literacy, Social Determinants And Overweight And Obesity Among Middle Aged Women In Myanmar: A Cross Sectional Analytical Study

Than Kyaw Soe¹, Wongs Laohasiriwong, Somsak Pitaksanurut, Teerasak Phajan

United Nations Children's Fund,
Mandalay, Myanmar, PH-95-09-43153492
thankyawsoe82@gmail.com

Khon Kaen University, Research and Training Center for Enhancing Quality of Life of Working Age People,
Khon Kaen, Thailand, PH-66-08-73731199
drwongsa@gmail.com

Khon Kaen University, Faculty of Public Health,
Khon Kaen, Thailand, PH-66-43347057

Sirindhorn College of Public Health,
Khon Kaen, Thailand, PH-66-43267041

Abstract: Introduction: Obesity is major public health challenge worldwide especially among middle aged women. Health literacy have been identified as one of a measured for overweight and obesity control. Objective: To determine the prevalence of overweight and obesity and to identify the association between health literacy, social determinants and overweight and obesity among middle aged women in Magway Region, Myanmar. Methodology: This cross-sectional analytical study was conducted in 4 townships of Magway region, Myanmar. Total of 402 female aged 45-65 years old were selected by using multistage random sampling. After getting the consent from participants, the weighting and measuring were done first and the data was collected with the structured questionnaire. The multiple logistic regressions were used to determine the association presenting adjusted odd ratio with 95% confident interval. **Result:** The results indicated that majority of middle-aged women were married (65.42%), their average age was 52.91 ± 54.13 years. As high as 37.81% were obesity (95% CI: 33.18%-42.68%) and 17.16% (95%CI: 13.77% - 21.19%) were overweight. Most of them had low level of health literacy (73.13%). Factors associated with overweight and obesity were having problematic disease prevention health literacy (AOR=4.23, 95%CI:2.06-8.67; p-value<0.001), inadequate disease prevention health literacy (AOR=6.97, 95%CI:3.12-15.56; p-value<0.001), problematic health promotion health literacy (AOR=2.22, 95%CI:1.14-4.35; p-value=0.019) and inadequate health promotion health literacy (AOR=4.48, 95%CI:2.08-9.66; p-value<0.001). Furthermore, urban residents (AOR=3.31, 95% CI:1.92 to 5.70; p-value<0.001), had family history of overweight and obesity (AOR=2.29, 95% CI:1.29 to 4.45; p-value=0.004), consumed rice more than 8 serving spoons per day (AOR=2.03, 95% CI:1.14 - 3.60; p-value=0.016) and having vigorous activities (AOR=4.63, 95%CI:1.37 to 15.65; p-value=0.014) also associated with overweight and obesity among middle aged women. **Conclusions:** There were high prevalence of overweight and obesity. Poor health literacy, heredity and behaviors had influence on these nutritional problems.

Keywords: health literacy, obesity, overweight, women

1. Introduction

Obesity is major public health challenge worldwide especially among middle aged women. Deaths caused by overweight and obesity in world's population is more than underweight deaths.⁽¹⁾ Nearly two-third of diabetes, about one-fourth of ischemic heart diseases and most of the cancer are relating with overweight and obesity.⁽²⁾ Obesity is defined as the accumulation of fat in the body excessively and that situation lead to affect to the health. In Myanmar, according to the WHO's NCD surveillance Yangon in 2003-2004, overweight prevalence in male was 20.6% and female was 29.96%.⁽³⁾ And according to 2009 non-communicable disease survey, the overall prevalence of overweight and obesity of Myanmar population was 25.38% and 6.8%. That survey results identified that 8% and 22% of female respondents were obese and overweight respectively. Among the middle aged groups of women, only less than 50% had normal body weight.⁽³⁾ Health literacy have been identified as one of a measured for overweight and obesity control.⁽⁴⁾ But a limited

number of studies were done to find out the association between health literacy level and obesity status of the people. Moreover, there is no strong and clear evidence about the relation between health literacy level and getting weight status among risky middle-aged women. The objective of this study are to determine the prevalence of overweight and obesity and to identify the association between health literacy, social determinants and overweight and obesity among middle aged women in Magway Region, Myanmar.

2. Methodology

Study design and participants: This cross-sectional analytical study was conducted in 4 townships of Magway region, Myanmar. Study population was the women who aged 45 to 65 years old at the time of data collection. The eligible sample was fulfilled with the inclusion and exclusion criteria. Inclusion participants were who gave informed consent to participate in this study and who live in this area since at least last one year ago. Exclusion participants were who were suffering serious health problems (lying on the

bed), who suffered who are in diarrhea at the time of data collection (defecating more than 3 times), who were in pregnancy, individuals with mental disabilities, congenital bone deformities. The sample size was estimated based on the multiple logistic regressions formula (Hsieh, Bloch, & Larsen, 1998). Multistage random sampling was used to select samples in this study. Firstly 4 townships were selected by simple random sampling from overall 25 townships of Magway region. And then 2 wards and 3 villages were selected from these townships by using simple random sampling also. After that, sample households were selected using systematic random sampling procedure. Research Indicators: Body height in centimeters (cm) and weight in kilograms (kg) were measured to the nearest 0.1 cm and 0.1 kg by using metering object and digital weighing instrument these were recognized and used in health department. Body mass index was used and defined values as underweight and normal for lower than 23 kg/cm², overweight for over and equal 23.0 kg/cm² to under 25.0 kg/cm² and obesity for over and equal 25.0 kg/cm². This Asia health literacy questionnaire tool for obesity was used to measure health literacy level of individuals. The health literacy score intervals were categorized into 4 levels for each indices: 0 to 25 points as 'inadequate', more than 25 to 33 points as 'problematic', more than 33 to 42 points as 'sufficient' and more than 42 to 50 points as 'excellent'.⁽⁵⁾ Socio-demographic characteristics were included age, marital status, education, occupation, place of resident, income of family, individual income, reproductive health status and family history of obesity. Personal behavior of each participants were measured by TV and internet watching hours, physical activities, current or former smoker, passive smoker, ever used contraceptives and food intake variables. Depression factor was measured by Center of Epidemiological Studies Depression Scale CESD and stress condition of individuals were measured by Perceived Stress Scale (PSS). Each participants were categorized into 2 states who was living on above the mean score of depression and stress level or not based on the CESD and PSS algorithm logic. Statistical Analysis: The raw data of 402 respondents were recorded into MS Excel. The data were inverted into the Stata program version 13.0. The socio-demographic and baseline characteristics of the participants were described with frequency and percentage for categorical data and mean, median, minimum, maximum and standard deviation for continuous data. The multiple logistic regression, adjusted OR with 95% of Confident Interval were used to determine the association between overweight and obesity status of middle and old aged women and health literacy factors by controlling other related factors. All test statistics were two-sided and a p-value of less than 0.05 was considered as statistical significant.

3. Results

Prevalence of overweight and obesity among middle aged women: In 402 total participants, 181 (45.02%, 95%CI: 40.2%-49.9%.) were underweight and normal healthy range of body weight 69 (17.16%, 95%CI: 13.77% - 21.19%)) were overweight and 152 (37.81%, 95% CI: 33.18%-42.68%) were obesity. Lowest body mass index was 12.73 kg/cm² and highest index was 44.47 kg/cm². Mean body mass index of middle aged women was 23.85 kg/cm². Over half of middle aged women who lived in Magway region Myanmar were in overweight and obesity.

Table 1 Overweight and obesity among middle and old aged women

Overweight and obesity status	Total (n=402)		
	Number	%	95%CI
Underweight and healthy range	181	45.02	40.20-49.90
Overweight	130	32.34	13.77 - 21.19
Obesity	91	22.64	33.18-42.68
Mean (S.D.)	23.85(± 4.72)		
Median(Min:Max)	23.44 (12.73:44.47)		
95% CI	(23.38-24.31)		

Baseline characteristics of overweight and obesity among middle aged women: Majority of them were married (65.42%) and the mean age was 53.52 years. 41.34% of total respondents had not attained normal education system and over half of them (60.95%) were farmers. In personal behavior, 11.19% of respondent women used internet over 15 minutes per day and 38.81% of respondent used contraceptive pill or injection in the past. Health care health literacy level relating with overweight and obesity is only 6.47% had excellent state and 26.12% were in sufficient health literacy level. Most of the respondents are in inadequate and problematic health literacy level. About two third of total respondents are weak in overweight and obesity health care literacy index. Mean score of health care health literacy index is 28.97 and SD is 7.54. Only 3.73% of middle aged women has excellent disease prevention obesity health literacy index and 23.13% has sufficient level. Inadequate health literacy is 39.80% and problematic 33.33% respectively. So, 73.13% of total respondents are in weakness in overweight and obesity prevention health literacy. Mean disease prevention health literacy index is 27.40 and SD for that is 8.42. Health promotion health literacy in overweight and obesity is; inadequate health literacy 34.33%, problematic health literacy 37.06%, sufficient health literacy 25.37% and excellent health literacy 3.23% respectively. Obesity promotion health literacy index of all respondents ranged from 9 to 48 scores. Mean index score is 27.95 and SD is 7.66. General overweight and obesity health literacy score ranged from 11 to 49. Most of the middle aged women (39.55%) were in problematic general health literacy index followed by inadequate health literacy 33.33%, sufficient health literacy level 24.38% and excellent state 2.74%. 72.88% are weak in health literacy and only 27.12 are in good literacy state about overweight and obesity. Mean score of general health literacy is 28.11 and SD for that is 6.97.

Table 2. Factors associated with overweight and obesity (Multivariate analysis)

Variable	Total (No.)	Overweight and Obesity (%)	Crude OR	Adjusted OR	95% CI
Place of resident					p <0.001
Rural	199	40.70	1	1	
Urban	203	68.97	3.24	3.31	1.92 - 5.70
Family history of overweight/obesity					p <0.001
No	284	48.24	1	1	
Yes	118	71.19	2.65	2.29	1.29 - 4.45
Rice eating amount per day					p = 0.016
< 8 rice serving spoons	111	41.44	1	1	
≥ 8 rice serving spoons	291	60.14	2.13	2.03	1.14 - 3.60
MET score for vigorous activities per week					p = 0.014
≥ 1	25	57.56	1	1	

< 1	377	16.00	7.21	4.63	1.37-15.65
Disease prevention health literacy index					p < 0.001
Sufficient & excellent health literacy	108	22.22	1	1	
Problematic health literacy	134	58.21	4.88	4.23	2.06 - 8.67
Inadequate health literacy	160	74.38	10.16	6.97	3.12-15.56
Health promotion health literacy index					p < 0.001
Sufficient & excellent health literacy	115	21.74	1	1	
Problematic health literacy	149	57.05	4.78	2.22	1.14 - 4.35
Inadequate health literacy	138	80.43	14.8	4.48	2.08 - 9.66

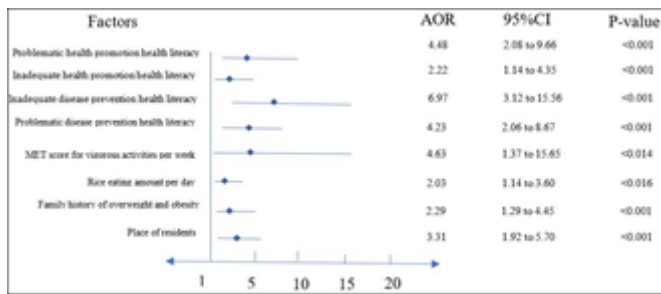


Figure 1 Forest plot diagram for factors associated with overweight and obesity multivariate analysis

The respondents who live in urban areas were more likely to have overweight and obesity compared with women who settled in rural areas about 3 times (AOR=3.31, 95% CI: 1.92 to 5.70; p-value<0.001). Those women who had family history of overweight and obesity (AOR=2.29, 95% CI: 1.29 to 4.45; p-value=0.004) were also significantly more likely to suffer overweight and obesity. And over 8 serving spoons rice eating amount per day (AOR=2.03, 95% CI: 1.14 - 3.60; p-value=0.016) was significantly more likely to get overweight and obesity. Those women who doesn't have vigorous activities per week were more likely about over 4 times to have overweight and obesity than women with weekly basis vigorous activities (AOR=4.63, 95%CI:1.37 to 15.65; p-value=0.014). The respondents with problematic prevention health literacy level (AOR=4.23, 95%CI: 2.06-8.67; p-value<0.001) and inadequate prevention health literacy (AOR=6.97, 95%CI: 3.12-15.56; p-value<0.001) were more likely to be overweight and obesity than sufficient and excellent health literacy level respondents. Concerning with health promotion health literacy, middle and old aged women with problematic health literacy (AOR=2.22, 95%CI: 1.14-4.35; p-value=0.019) and inadequate health literacy respondents (AOR=4.48, 95%CI: 2.08-9.66; p-value<0.001) were more likely to get overweight and obesity than compared group.

Discussion: More than half of the middle-aged women respondents were in overweight and obesity. According to ASEAN standard measurement, this study found that 32.34% of them were in overweight and 22.64% were obesity in general population. So, the overweight percentage of current study was increased than the overweight prevalence of general adult population of ASEAN Countries. (6) After controlling the confounding factors with backward elimination multivariate analysis, six variables were strongly associated with overweight and obesity among middle aged

women. They were place of resident, family history, having vigorous activities per week, disease prevention health literacy index and health promotion health literacy index. Urban middle-aged women were more likely to be overweight and obesity about 3 times than rural dwellers. Overweight and obesity was associated with residing place differences in this study which is similar to the study conducted in Eastern Uganda (Barbara Eva Kirunda et al 2015)⁽⁷⁾ and Panama (Anselmo Mc Donald et al 2015)⁽⁸⁾. Women with family history for overweight and obesity were also 2 times more chance to get overweight and obesity than the women with not a family history. Some studies identified that people with family history of overweight and obesity had 2.7 times more likely to get overweight and obesity (Anselmo Mc Donald et al 2015)⁽⁸⁾. Over rice eating than 8 rice serving spoons had 2 times to get weight than under 8 spoons eating women. Previous study (Simin Liu et al 2003)⁽⁹⁾ also found that increased intake of whole or refined grains products consuming over time was positively associated with overweight and obesity status of middle aged women. This study found that vigorous physical activities can reduce the risk of overweight and obesity about 7 times among middle aged women. Some studies identified that there were associations between physical activities and weight gaining with specifying on other aged groups such as school children and adults aged group (Shu Fang Shih et al 2016, Marie Claire Chamieh et al 2015, Anselmo Mc Donald et al 2015)^(4, 8, 10). Moreover, Dixie L et al 2004 examined that the relationship between accumulated walking and body composition of middle-aged women. One Taiwan population-based survey study demonstrated strong link between health literacy and obesity among sixth grade school children (4). This study also found that the higher score in disease prevention and health promotion health literacy index, the less to get overweight and obesity among middle aged women. And another China study illustrated that adolescent students with aged 12-16 years old with low health literacy level had 2 times more likely to be overweight and obesity than the students with high health literacy level.⁽¹¹⁾ This finding fulfilled and supported previous literature of showing the association between health literacy level and obesity status.

Strength of Study: Despite this study, it is the first report on finding the association between health literacy index and overweight and obesity among middle aged women in the Magway region of Myanmar. Therefore, this research study can be a reference for similar studies which will be performed in different part of Myanmar and other countries. **Limitation of Study:** Since the current study was a cross-sectional analytical study, further study with operational research or longitudinal cohort study design was recommended to provide the better understanding of the relationship between health literacy index and overweight and obesity among middle aged women.

4. Conclusion

There were high prevalence of overweight and obesity. Poor health literacy, heredity and behaviors had influence on these nutritional problems. Conducting to increase disease prevention and health promotion health literacy level of middle and old aged women, balancing on the daily diet intake, promoting to do the strenuous physical exercise, provision of supportive measure for obesity prevention could

be helpful to achieve the reduction of overweight and obesity and then that lead to decrease non-communicable diseases that caused by obesity.

5. Recommendations

This study encourages the government departments and related organizations to conduct for the improvement of obesity health literacy among middle and old aged women in Myanmar. It is also important to promote healthy lifestyle and eating pattern.

Acknowledgement: I would like to express my sincere thanks to village and ward administrators, community leaders and health staffs of Magway region, Myanmar to allow me data collection and for their valuable information, supports and participation in this study. My profound appreciation and special thanks to all the participants who kindly consented and gave their valuable information for this study.

Funds: This work is financially supported by Faculty of Public Health, Research and Training Center for Enhancing Quality of Life of Working Age People, Khon Kaen University, Thailand.

6 References

- [1] WHO. WHO fact sheet: overweight and obesity. 2015.
- [2] WHO. Global status report on noncommunicable diseases 2010. WHO library cataloguing. 2011.
- [3] WHO. Non communicable disease risk factor survey, Myanmar 2009. 2011;SEA-Tobacco-40.
- [4] Shih SF, Liu CH, Liao LL, Osborne RH. Health literacy and the determinants of obesity: a population-based survey of sixth grade school children in Taiwan. *BMC Public Health*. 2016;16:280.
- [5] Jurgen M Pelikan FR, Kristin Ganahl. Comparative report on health literacy in eight member states. The European health literacy project 2009-2012. 2012.
- [6] Ramachandran A, Snehalatha C. Rising burden of obesity in Asia. *J Obes*. 2010;2010.
- [7] Kirunda BE, Fadnes LT, Wamani H, Van den Broeck J, Tylleskar T. Population-based survey of overweight and obesity and the associated factors in peri-urban and rural Eastern Uganda. *BMC Public Health*. 2015;15:1168.
- [8] Mc Donald A, Bradshaw RA, Fontes F, Mendoza EA, Motta JA, Cumbreira A, et al. Prevalence of obesity in panama: some risk factors and associated diseases. *BMC Public Health*. 2015;15:1075.
- [9] Liu S. Relation between changes in intakes of dietary fibre and grain products and changes in weight and development of obesity among middle aged women. *American Society for Clinical Nutrition*. 2003;Am J Clin Nutr 2003;78-920-7.
- [10] Chamieh MC, Moore HJ, Summerbell C, Tamim H, Sibai AM, Hwalla N. Diet, physical activity and socio-economic disparities of obesity in Lebanese adults: findings from a national study. *BMC Public Health*. 2015;15:279.
- [11] Lam LT, Yang L. Is low health literacy associated with overweight and obesity in adolescents: an epidemiology study in a 12-16 years old population, Nanning, China, 2012. *Arch Public Health*. 2014;72(1):11.

7 Author Profile



Author 1 graduated the Bachelor of Community Health (B.Comm;H) degree from University of Community Health, Magway, Myanmar in 2005, MPH (International Health) degree from Khon Kaen University, Khon Kaen, Thailand in 2017 and MPA degree from Meiktila University of Economics, Mandalay, Myanmar in 2019. During 2005-2008, he served as Tutor in Epidemiology Department, University of Community Health, Magway, Myanmar. Then, worked as public health professional in World Health Organization (WHO) and United Nations Children's Fund (UNICEF) from 2009 to present.