

RELATIONSHIP BETWEEN HOUSEHOLD ACTIVITIES PERFORMANCE AND BODY MASS INDEX OF HOUSEWIVES**ROQEEB BABATUNDE RAJI^{1*}, ABRAHAM ADEGBOLA¹, ADEBIMPE YETUNDE OWOYEMI¹,
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ABSTRACT**Objective:** The objective of this study was to find out the relationship between household activities performance and body mass index (BMI) of housewives.**Methods:** This cross-sectional study was undertaken among housewives residing in Shivalli village in Udipi district. The ages of the participants were between 30 and 45 years. The total number of the participants was 61. Household activities performance questionnaire was developed for data collection. The content of the questionnaire was validated by five registered occupational therapists with more than 15 years' experience. The BMI of the participants was taken to ascertain their body weight status. Semi-structured interview was conducted to inquire about their household tasks using the developed household activities performance questionnaire. A diet chart with a total number of 7 days of meal was collected to calculate the participants' calorie intake. The corresponding metabolic equivalent of task values for each mentioned task was assigned from compendium of physical activities (PA) to determine the relationship between household activities (manual and mechanical) performance and BMI of the participants.**Results:** While there was no significant negative correlation between housewives' household manual activities performance and their BMI, housewives' household mechanical activities performance and BMI showed a significant positive correlation. Sociodemographic characteristics showed no significant weak negative relationship with BMI score except socio-economic status which showed a significant weak positive relationship.**Conclusion:** Household activities performed by housewives might not have an impact on their BMI. However, combining household activities with moderate PA might tends to have an impact on the BMI of housewives. Further study with more sample size and a standardized questionnaire is recommended for future study.**Keywords:** Housewives, Body mass index, Household activities.© 2024 The Authors. Published by Innovare Academic Sciences Pvt Ltd. This is an open access article under the CC BY license (<http://creativecommons.org/licenses/by/4.0/>) DOI: <http://dx.doi.org/10.22159/ajpcr.2024v17i6.50828>. Journal homepage: <https://innovareacademics.in/journals/index.php/ajpcr>**INTRODUCTION**

The fifth edition of National Family Health Survey 2022 stated that the percentage of married women (including housewives) who are overweight and obese is estimated to be 24.0% [1,2]. Increased calorie intake and higher socioeconomic status (SES) were some contributing factors identified in the literature [3-5]. Most related studies [6-10] had justified that these factors might be responsible for the increase in their body mass index (BMI) status. However, scanty evidence was able to look into household activities performed by women, especially housewives. As a result, this study intends to examine the relationship between household activities performance and BMI of housewives.

Research question

Does household activity performance have any impact on the BMI of housewives?

Aim of the study

The aim of this study was to study the relationship between household activity performance and BMI of housewives.

METHODS

A cross-sectional study design was used for this study. The targeted population was Indian housewives residing in Shivalli village, Udipi district. Convenience sampling comprising 61 housewives was used

in the study. The participants were all housewives between 30 and 45 years and married for more than 5 years. Their calorie level intake according to gender, age, and work criteria is stipulated at 1875 cal/day [11]. This was the standardized value given for the age involved in this study. Furthermore, the participants must not involve in any active leisure or exercise regimen. Pregnant women and lactating women were excluded from the study.

Materials used

- Household activity performance questionnaire: It is a rater-administered questionnaire. It contained different household activities. For each item of the home activities, participants were asked about the performance of each activity and the way in which this task was performed. The way of activity performance can either be manually (self-performance such as washing cloth by hand) or mechanically (use of gadget such laundry machine for cloth washing). The duration of the activity performance was also included in the study. Data collected were all documented.
- Weight scale and inch tape: These two instruments were used to know the BMI of the study participants. While the weight scale was used to measure the weight of the housewives, the inch tape was used for measuring their height. Then, the weight is divided against height to calculate the BMI status of the study participants. The unit for weight is kilogram (kg). Meters squared is the unit for height and BMI unit is kilogram per meter squared (kg/m²).

- Compendium of physical activity: Compendium of physical activities (PA) was developed by Dr. Bill Haskell through comparability of results across studies using self-report from different types of PA including household activities. The tool assigned unit of energy expenditure to different types of household activities. The purpose is to allow the housewives to know the total number of unit of energy expended during their task performance. The second edition of compendium of PA was used in this study [12].

Modified Kuppaswamy SES scale: This scale is developed to measure SES of families in urban and rural settlements. The scale was named after its creator "Kuppaswamy," it consists of a composite score which was based on the education, occupation, and the family head income per month [13]. Based on the family monthly income, the scale categorized families into upper, upper middle, lower middle, upper lower, and lower level SES. However, for the purpose of clarity, this study categorized the family into two levels, namely, upper-middle (which include upper, upper middle, and lower middle) and lower (which consist of upper lower and lower).

Procedure

The study was done in two phases. These include:

Phase I: Development of household activity performance questionnaire and content validity

Items were generated from reviewing of literatures related to the objective of the study. Semi-structured interview was also conducted for eleven housewives residing in Shivalli village. Based on the information gathered, a household activity performance questionnaire was developed by the investigators. Content validity for the questionnaire was established by reviewing the components with five experienced occupational therapy professionals. Each professional was allowed to spend at least 1 week for reviewing of the questionnaire. The feedback from them was noted and implemented accordingly.

Phase II: Collection and analysis of data

The research Institution Ethical Committee approval was obtained before the commencement of this study. This was followed by recruiting participants from different places in Shivalli village. Having explained the aim of the study to the recruited participants, written informed consent was obtained from the housewives who were interested in participating in the study. Height and weight of the interested participants were taken afterward by the researchers. This is to calculate the BMI of the participants. The calculated BMI was further grouped into either normal or overweight/obese using Asia-Pacific classification [14]. The sociodemographic characteristics and the medical history of the participants were collected through a semi-structured interview. This is to rule out health-related conditions that can affect the household activities performance of the housewives. The participant's diet diary for the past 1 week was also recorded to rule out bodyweight gain due to nutrition. This was followed by the documentation of household activities performed by the participants. These activities were divided into in-door and out-door household activities for understanding purpose. The in-door household activities were activities performed within the house by the housewives such as washing plates, mopping the floor, and cooking. Household activities such as gardening, raking, and cleaning of house compounds which were performed within the house environment were categorized as out-door household activities. Household activities reported by the housewives for a typical day were noted in the questionnaire along with the number of minutes spent in performing them. Energy unit for each reported in-door and out-door household activities of the housewives was assigned based on the number of unit given in the compendium of PA for each household activity. This unit of energy is also referred to as metabolic equivalent of task (MET) unit. A unit of MET is defined as the ratio of a person's working metabolic rate relative to his/her resting (basal) metabolic rate [15]. The usual time spent in each activity was multiplied by specific MET values already assigned for each noted household activity and the total MET level for all the mentioned household activities was calculated. Data obtained were entered into an excel sheet and data analysis was followed.

The data were analyzed using Statistical Package for the Social Sciences version 16. Descriptive statistics was used for sample characteristics and Spearman rank correlation analysis was used to find out the relationship between the performance of household activities and BMI of the housewives. The results were computed documented below.

RESULTS

Sociodemographic characteristics of the participants (housewives)

Table 1 below described the sociodemographic characteristics of respondents. The mean age of the respondents is 40.26 ± 11.21 years. 36.1% (22) of the respondents were between the age 25 and 34, 26.2% (16) of them were between the age 35 and 44 while more than two-fifths (37.7%) of their age being ≥ 40 years. The average height and weight of respondents were 1.54 ± 0.06 and 67.15 ± 7.18 , respectively. The median level of manual activities was 12876.5 (1856) and that of mechanical activities was 787.5 (1050). More than 80% (49) of the respondents were from a nuclear family while <20% (12) were from an extended family. Respondents with the number of children ≥ 2 were 45 (73.8%) and 26.2% (16) have only one child each. Those with family members ≤ 4 were 42 (68.9%) while others (31.1%) have >4 family members. The average of years spent on marriage by respondents was 19.36 ± 11.52 years. More than two-thirds (72.1%) of the respondents had an upper/middle SES with the rest (27.9) belonging to the lower SES. The BMI scores of the respondents are also described in Fig. 1.

Table 1 shows the Mean, Median (interquartile range) standard deviation, and percentage (%) of the sociodemographic characteristics of the respondents.

Fig. 1 shows the BMI scores for respondents. Majority (90.2%) of the respondents have a normal BMI score.

BMI score, manual activities performance, and mechanical activities performance relationship

Table 2 conveyed the BMI scores (as well as in Fig. 1), manual activities performance, and mechanical activities performance relationship. For BMI score and manual activities performance, there is no significant weak negative relationship $r = -0.1$, $p = 0.348$. However, between BMI

Table 1: Sociodemographic characteristics of the participants

Variable	n=61, n (%)
Age, mean \pm SD	40.26 \pm 11.21
Height (m ²), mean \pm SD	1.54 \pm 0.06
Weight (kg), mean \pm SD	67.15 \pm 7.18
Manual activities, median (IQR)	1856 (12876.5)
Mechanical activities, median (IQR)	1050 (787.5)
Family (nuclear/extended)	49/12 (80.3/19.7)
Number of children-1/ \geq 2	16/45 (26.2/73.8)
Family member- \leq 4/>4	42/19 (68.9/31.1)
Marriage duration (years), mean \pm SD	19.36 \pm 11.52
Upper-middle/lower class SES	44/17 (72.1/27.9)

**SES: Socioeconomic status, SD: Standard deviation, IQR: Interquartile range

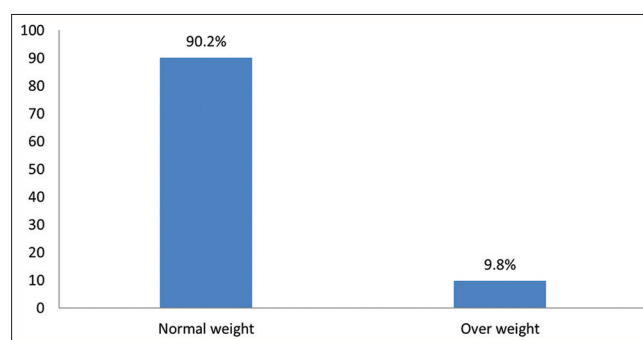


Fig. 1: Body mass index scores distribution of the participants

scores and mechanical activities performance, there is a significant positive relationship $r=-0.4$, $p=0.3$.

Table 2 shows the relationship between BMI scores, manual activity performance, and mechanical activities performance of the study respondents using Spearman's rank correlation coefficient.

Table 3 showed the relationship between the BMI and the sociodemographic characteristics of all the study respondents ($n=61$).

Relationship between BMI scores and sociodemographic characteristics

In Table 3, the relationship between BMI scores and sociodemographic characteristics is elaborated. It can be seen that there is no significant weak negative relationship between the BMI score and the family Type $r=-0.04$, $p=0.767$. Furthermore, there is no significant weak negative relationship between the BMI score and the number of children $r=-0.1$, $p=0.459$. There is no significant weak negative relationship between the BMI score and duration after marriage $r=-0.07$, $p=0.579$. There is

a significant weak positive relationship between the SES and BMI score at $r=0.22$, $p=0.082$.

DISCUSSION

This cross-sectional study was done to find out the relationship between household activity performance and the BMI of housewives. Sixty-one housewives in total participated in the study. The participants were between the ages of 30 and 45 years. In addition, the participants were required to be married for at least 5 years and should be cognitively intact. All the housewives were selected from the same geographical area. The diet factor was controlled by collecting their diet diary of 1 week duration to ensure the calories intake of all the involved housewives was at normal level according to gender, age, and activities criteria. This is in accordance with the diet guideline of the National Institute of Nutrition which already stated above. To prevent other ways in which their energy was expended, housewives with any active leisure or exercise regime were excluded from the study.

Our findings showed that there was a weak negative correlation between BMI status and manual activity performance of the participants. This means that considering only manual household activities performed by housewives may have lesser significant or no effect on their BMI. A study [16] considering the association between BMI, basic activities of daily living (BADL), and I-activities of daily living (IADL) among the older population supported our finding. This is due to the fact that the study found no significant associations between BMI, BADL, and IADL. However, combining manual household activities performance with moderate PA (sufficient PA and not vigorous PA) among housewives might tend to have a significant effect on their higher BMI status [17]. In an attempt to find the relationship between mechanical household activities performance and the BMI of housewives, we found that there was a significant positive correlation between mechanical household activities performance and the BMI of the participants. This indicates that engaging in lesser energy-consuming household activities (more of a sedentary lifestyle) might lead to an increase in the housewives' BMI. The finding from a 2021 study [18] and another study [19] which was conducted among children with and without childhood obesity by Raji *et al.* reveal a similar result despite the difference in the study participants.

Table 2: Body mass index score, manual activities performance, and mechanical activities performance

Correlation coefficient	BMI	Manual activities performance	Mechanical activities performance
Spearman's rho			
BMI			
Correlation coefficient	1.000	-0.104	0.348**
Significant (two-tailed)		0.427	0.006
n	61	61	61
Manual performance			
Correlation coefficient	-0.104	1.000	0.161
Significant (two-tailed)	0.427		0.216
n	61	61	61
Mechanical performance			
Correlation coefficient	0.384**	0.161	1.000
Significant (two-tailed)	0.006	0.216	
n	61	61	61

**Correlation is significant at the 0.01 level (two-tailed). BMI: Body mass index

Table 3: Relationship between body mass index score and sociodemographic characteristics

Correlation coefficient	BMI	Types of family	Number of children	Total number of family members	Duration after marriage	SES
Spearman's rho						
BMI						
Correlation coefficient	1.000	-0.039	-0.097	-0.052	-0.073	0.224
Significant (two-tailed)		0.767	0.459	0.688	0.579	0.082
n	61	61	61	61	60	61
Types of family						
Correlation coefficient	-0.039	1.000	0.045	-0.721**	0.341**	-0.139
Significant (two-tailed)	0.767		0.729	0.000	0.008	0.286
n	61	61	61	61	60	61
Number of children						
Correlation coefficient	-0.097	0.045	1.000	0.599**	0.364**	0.026
Significant (two-tailed)	0.459	0.729		0.000	0.004	0.841
n	61	61	61	61	60	61
Total number of family members						
Correlation coefficient	-0.052	-0.721**	0.599**	1.000	0.001	0.124
Significant (two-tailed)	0.688	0.000	0.000		0.993	0.341
n	61	61	61	61	60	61
Duration after marriage						
Correlation coefficient	-0.073	0.341**	0.364**	0.001	1.000	-0.246
Significant (two-tailed)	0.579	0.008	0.004	0.993		0.058
n	60	60	60	60	60	60
SES						
Correlation coefficient	0.224	-0.139	0.026	0.124	-0.246	1.000
Significant (two-tailed)	0.082	0.286	0.841	0.341	0.058	
n	61	61	61	61	60	61

**Correlation is significant at the 0.01 level (two-tailed). SES: Socioeconomic status, BMI: Body mass index

Many studies [20-23] have shown that the sociodemographic components which include age, number of children, number of family members, duration after marriage, and SES contribute to BMI. Hence, we examine the correlation between these sociodemographic characteristics to BMI of housewives. Our findings showed that age, number of children, family members, and duration after marriage have no relationship with BMI of housewives. However, we found SES to have a positive correlation with the BMI of housewives. Although Miller *et al.* [24], finding is in contrast which might be as a result of differences in the criteria of their study and ours a study [25] conducted in 2019 among students between the ages of 12 and 17 showed a similar result.

Our study strength included the fact that all housewives involved were married for more than 5 years. Considerations were given to both BADL and IADL in the development of the questionnaire. The limitations are that our data collection was done through the developed household activity performance questionnaire; future study can focus on using a more standardized questionnaire. Furthermore, the data collected were for household activities performed for a typical day, future research can extend the duration of the household activities for a period of 1 week. In addition, a larger sample size is recommended for future work related to this concept as our study involved only a small sample size.

CONCLUSION

The aim of our study was to see whether there is a relationship between the performance of household activities and the BMI of housewives. Housewives residing in Shivalli village, Udupi district, were selected for the research work. The outcome of our study reveals no significant positive correlation between household activity performance and the BMI status of housewives. Therefore, we concluded that household activities performed by housewives might have an impact on their BMI when combined with moderate PA.

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AUTHOR CONTRIBUTIONS

Roqeeb Babatunde Raji: One of the study concept originators and modifying the study topic. Furthermore, involved in the study design, definition of intellectual content, literature search, data acquisition, data analysis, statistical analysis, manuscript preparation, manuscript editing, and review. The said author will be the guarantor of this research work, Abraham Adegbola: One of the study concept originators. Furthermore, involves in study design, definition of intellectual contents literature search data acquisition manuscript preparation. Adebimpe Yetunde Owoyemi: One of the study concept originators. Furthermore, involves in study design, the definition of intellectual contents literature search data acquisition manuscript preparation, Olalekan Waliyilahi Salawu: Responsible for data acquisition, data analysis, statistical analysis as well as manuscript preparation. Dr. Guruprasad Vijayasarithi: One of the study concept originators modified the study title. Involved in the study designed, definition of intellectual content, statistical analysis, manuscript editing, and review as well as supervising every step of the research work

CONFLICTS OF INTEREST STATEMENT

Authors have no any actual or potential conflicts of interest to declare.

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