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ORIGINAL ARTICLE

A CROSS-SECTIONAL STUDY: THE RELATIONSHIP BETWEEN PHYSICAL ACTIVITY AND MENTAL WORKLOAD AMONG HOUSEWIVES

Hubungan Aktivitas Fisik dengan Beban Kerja Mental pada Ibu Rumah Tangga

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ABSTRACT

Background: The role of housewives, particularly those with toddlers, is physically and mentally demanding, often leading to high stress levels and workload. **Purpose**: This study examined the relationship between physical activity and mental workload among homemakers. **Methods**: A cross-sectional design was employed, utilizing the IPAQ-SF and RSME questionnaires to assess physical activity and mental workload. The study included 46 participants, most of whom were young mothers with one child and had a high school education. **Results:** The mothers had a high level of physical activity (16,479.85 ± 16,983.35 MET-min/week) and experienced a considerably quite large workload (mean score: 72.90). However, there was no significant relationship between physical activity and mental workload ($\beta = 0.28$, $p > 0.05$). **Conclusion**: These findings suggest that the physical and mental demands on homemakers are substantial, yet these factors may not directly influence their life satisfaction, highlighting the need for further research into the contributors to their well-being.

ABSTRAK

Latar belakang: *Peran ibu rumah tangga, terutama yang memiliki balita, menuntut fisik dan mental yang tinggi, yang sering kali menyebabkan tingkat stres dan beban kerja yang tinggi.* ***Tujuan:*** *Penelitian ini meneliti hubungan antara aktivitas fisik dan beban kerja mental di kalangan ibu rumah tangga.* ***Metode:*** *Desain potong lintang digunakan, dengan menggunakan kuesioner IPAQ-SF dan RSME untuk menilai aktivitas fisik dan beban kerja mental. Penelitian ini melibatkan 46 partisipan, yang sebagian besar merupakan ibu muda dengan satu anak dan berpendidikan SMA.* ***Hasil****: Para ibu memiliki*

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tingkat aktivitas fisik yang tinggi (16.479,85 ± 16.983,35 MET-menit/minggu) dan mengalami beban kerja yang cukup besar (skor rata-rata: 72,90). Namun, tidak ada hubungan yang signifikan antara aktivitas fisik dan beban kerja mental (β = 0,28, p > 0,05). ***Simpulan:*** *Temuan ini menunjukkan bahwa tuntutan fisik dan mental pada ibu rumah tangga cukup besar, namun faktor-faktor ini mungkin tidak secara langsung memengaruhi kepuasan hidup mereka, sehingga menyoroti perlunya penelitian lebih lanjut mengenai faktor-faktor yang berkontribusi terhadap kesejahteraan mereka.*

INTRODUCTION

Mothers who focus at home, known as housewives, have many responsibilities for their family unless working mothers were the additional career work. However, these duties at home will raise energy from physical to mental, leading to discomfort, fatigue (overstress), illness, injury, and even accidents, further reducing productivity. According to Zahl et al (1), the majority of studies indicated predominantly parental care for mothers who have mental health effects. An extent charge of homemakers having children or children - under 5 years - ascertain their health from physical and mental. Children under five years have high activity levels and need stimulation for growth and development. The risk factors Indonesian children under five years have impact diarrheal disease (2), pneumonia (3), and infection of rotavirus (4). Accordingly, mothers have endeavored to help their children to be in good health and have the capacity for growth and development.

In Indonesia, the high prevalence of women depression between working mothers and homemakers has been married, with rates of 22.70% and 21.80%, respectively (5). Furthermore, low income enables prolonged periods of mental health; however, hope and gratitude characteristics may negatively impact those (6).

Many tools are available to assess a person's physical activity, such as the IPAQ-SF (International Physical Activity Questionnaires-Short Form), GPAQ (Global PAQ), and PAQ. These tools have been tested in previous studies involving 306 healthy adults in Europe and, as a result, indicated that reliability and validity were low to moderate (7). Furthermore, an innovative approach to assess physical activity by utilizing a commercial fitness tracker, which monitors behavior 24/7 and can be combined with a sedentary questionnaire, providing comprehensive insights into activity levels and their impact on physical health (8). Moreover, small electronic devices (watch) trackers can record various health and fitness measurements and accurately track heart rate, energy expenditure, and step count. The drawback of using trackers is that these devices must be regularly upgraded and redesigned for new models, necessitating ongoing research and updated reviews (9).

There are three commonly used tools for measuring mental workload in research: the Subjective Workload Assessment Technique (SWAT), the NASA Task Load Index (NASA-TLX), and the Rating Scale Mental Effort (RSME). The difference between these tools lies in the dimensions they measure. SWAT uses three dimensions: effort load, time load, and psychological stress load (10). Previous studies have confirmed the validity of the RSME. At the same time, other tools like the NASA-TLX are also effective for measuring mental workload. The RSME is the most straightforward way to analyze subjective mental workload in homemakers (11). This study aimed to link physical activity and mental workload among homemakers.

METHODS

This study employs a cross-sectional design to evaluate physical activity and mental workload and, accordingly, sociodemographic data to find the additional data (12). There was no sample size calculation, but all available samples in the inclusion criteria were included in this study. This study had inclusion criteria for women who have at least one child, do not have a job outside the home, and do not have a helper. In contrast, the exclusion criterion was the presence of pathological conditions.

The measurement tools used in this study are the IPAQ-SF (International Physical Activity Questionnaire-Short Form) and the RSME (Rating Scale Mental Effort) questionnaires. When using the IPAQ-SF questionnaire, it is important to understand the items included. The questionnaire

consists of seven questions, which are then interpreted in time. Edwards and Loprinzi developed these questions in English and translated them into Indonesian to align with the communication style of the sample (13). The Indonesian version of the questionnaire has also undergone validity and reliability testing, with results showing that it is valid and reliable for measuring physical activity among the Indonesian population (14).

IPAQ-SF results are classified into low, moderate, and high. The energy required is defined in terms of METs, which is the multiple of resting metabolic rate in minutes per day. A low-level score corresponds to 3.3 METs, meaning 495 MET minutes per week. A moderate-level score corresponds to 4.0 METs, meaning 600 MET minutes per week. A high-level score corresponds to 8.0 METs, meaning 1200 MET minutes per week (8).

This study utilizes the RSME questionnaire, which is used to assess the workload of a housewife with a child or children. Six variables of questionnaire items are translated into Bahasa (15). Then, the responses are recorded using the RSME scale, ranging from 0 to 150. These statistical analyses were using SPSS version 25 and Excel. The measurement data conveyed sociodemographic, IPAQ-SF, and RSME as tools of this study. The sociodemographics were expressed as mean ± standard deviation (SD) and categorial. If the study was standard with the Kolmogorov-Smirnov test, Pearson's Correlation was used to examine the relationship between physical activity and mental workload. However, Spearman Rho was used if the study was not typical (16).

The rating scale, as illustrated in the (see figure 1), is further clarified by the following indicators of effort levels: none at all (0-10), almost none (11-28), very small (29-39), small (40-58), somewhat large (59-70), relatively large (71-85), large (86-100), very large (101-114), extremely large (115-150) (17). This research protocol was accepted by the research ethics committee of UPNVJ (Number 5/1/2025/KEP).

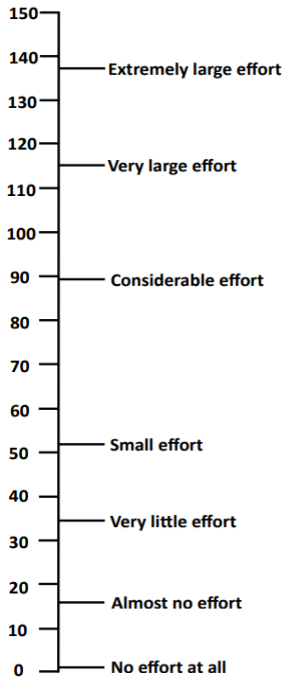

Figure 1. RSME Scale

RESULTS

This research acquired 46 samples, with the following variables in Table 1: mother's age, toddler's age, number of children in the household, mother's last education, and physical activity. Table 1 represents the characteristics of respondents in terms of frequency and percentage. Most mothers fell within the age range of 21-30 years, with a minimum and maximum of age 22 and 48 years old, respectively. Most children were between one and two years old, with minimum and maximum ages of 1 and 5, respectively. The vast of homemakers had only one child. Additionally, the highest education of participants was in High School.

Based on Table 2, it was evident that homemakers engage in vigorous physical activity with 10344.35 ± 13396.68 MET-min/week. Therefore, their weekly activity turned into 16479.85 ± 16983.35 MET-min/week.

Table 3 shows that the highest mental workload distribution among homemakers was in the category of work performance, with 88.70, with an extensive interpretation. On the contrary, work anxiety was slight for interpretation, thus the smallest of this rate. As a result, the average of homemakers was 72.90, which was quite large for the RSME score.

Table 1
Sociodemographic Characteristics of the Participants

Variable	n	%
Mother's age (years), mean ± SD 33.84 ± 8.04		
21-30	21	45.60
31-40	14	30.40
41-50	11	23.90
Toddle's age (years), mean ± SD 2.8 ± 0.98		
Under 1	11	23.90
1-2	14	30.40
2-3	9	19.60
3-4	9	19.60
4-5	3	6.50
Number of Children in the Household (child/children), mean ± SD 1.9 ± 0.9		
1	19	41.30
2	16	34.80
3	8	17.40
4	2	4.30
5	1	2.20
Mother's last education		
Elementary school	2	4.30
Junior high school	3	6.50
Senior high school	30	65.20
Under degree	4	8.70
Bachelor degree	6	13
Master degree	1	2.20
Physical activity		
High	42	91.30
Moderate	4	8.70

In Figure 2, scatter plots acquired correlation of (such as mother's physical activity and toddler's age) slightly drop; therefore, the more aged the child was, the less physical activity of mothers. Furthermore, the mother's physical activity and number of children fluctuated, and the mother's mental effort reached a plateau for toddler age and the number of children.

Table 4 presents the Spearman Rho test results, which were not standard data. It indicated no significant relationship between the level of physical activity and mental workload among homemakers, with ($\beta = 0.28$, $p > 0.05$).

Table 2
Physical Activity in MET-min/week

Variable	Mean ± SD V_{min}-V_{max}
Walking	1105.06 ± 2352,63 0-13,860
Moderate	5030.43 ± 5073.90 280-23,520
Vigorous activity	10344.35 ± 13396.68 0 - 53,760
Weekly Activity	16479.85 ± 16983.35 1260-87780

Table 3
The Average of Rating Scale Mental Effort Distribution of Housewives

Category	n	RSME Interpretation
Workload	73.80	Quite Large
Work Difficulty	67.30	Somewhat Large
Work Performance	88.70	Large
Mental Effort in Work	73.90	Quite Large
Work Anxiety	51.90	Small
Work Fatigue	81.90	Quite Large
Average	72.90	Quite Large

In Figure 2, scatter plots acquired correlation of (such as mother's physical activity and toddler's age) slightly drop; therefore, the more aged the child was, the less physical activity of mothers. Furthermore, the mother's physical activity and number of children fluctuated, and the mother's mental effort reached a plateau for toddler age and the number of children.

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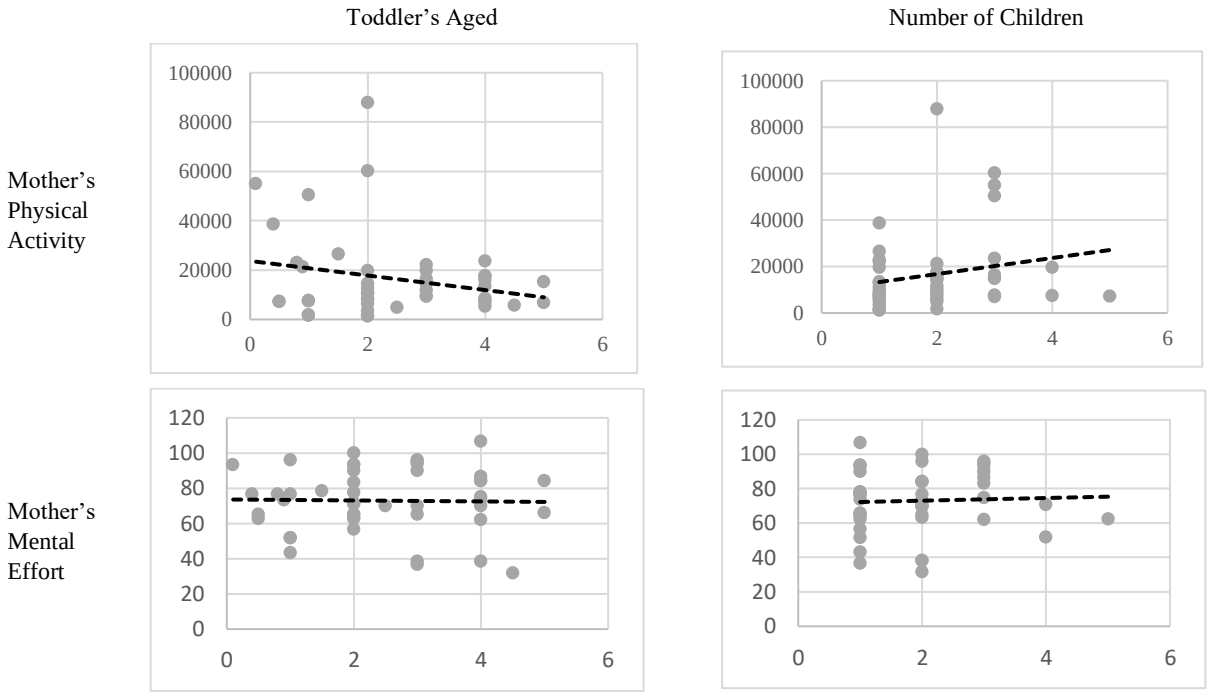

Figure 2. The Trends of Physical Activity and Mental Effort from Mother Correlation of Age and Number of Child from Children

Table 4
Analysis of the Relationship Between the Result of Physical Activity with Mental Effort for Housewives

RSME	Physical Activity Level		p-value
	Moderate	High	
Very Small	0	4	0.05
Small	1	3	
Somewhat Large	0	13	
Quite Large	1	12	
Large	2	8	
Very Large	0	2	
Total	4	42	

DISCUSSION

This study found that most of the 46 homemakers have an age range of 21-30 years old and have only one child with an age range of one to two years old. Most of the education level of these participants was high school. Regarding educational level, we have to know the effect on the knowledge and mindset of someone, enhancing her ability to absorb information effectively and solve problems as well (18). Notably, higher education levels are related to parenting practices, wherein children develop their growth and development (19). Additionally, better education showed that mothers would avoid having stunted or severely stunted children (20).

Unlike non-working mothers, higher stress and depression for working mothers (21). However, this stress could become a different category, whether from working or managing their household. The latter option, career mothers usually had assistance to care for children, ing, and all needs. Therefore, stress from working mothers could be investigated in the working environment. Along with this study, non-working mothers engage in excessive physical activity; from 42 per 46 participants, they tend to be higher, and others tend to moderate. Nevertheless, There is no difference in physical activity between mothers with the youngest child and those with another age (22). Accordingly, this is the limited study that examined the association between a child's age and a mother's physical activity, and this is the first study in Indonesia's area.

In this study, most of the mental workload distribution among homemakers was work performance. Depression and anxiety were the opposite, with the characteristics of hope and gratefulness being higher than those of the mothers. Liu et al (23) indicated that having two children was good for their physical and mental health. Notwithstanding the challenges of mental health problems, the appropriate identification, treatment, and screening are appealing to help mothers from their duties (24).

At this juncture in this study, the correlation between physical activity and mental workload indicated no relationship. Physical activity and mental workload affect each individual's performance differently; these may indicate life satisfaction. Life satisfaction is slightly higher among homemakers than working mothers, with a difference of only 1.64 for working mothers and 1.67 for housewives (25). Although life satisfaction may not necessarily be related to physical activity and mental workload in homemakers, this connection requires further research to be substantiated. Specific home-based physical activity needs to be taken to protect mental health (26).

CONCLUSION

This study highlights the complex and demanding role of homemakers, particularly those with young children, who often face high levels of physical activity and mental workload. The findings reveal that while homemakers generally engage in high levels of physical activity, there is no significant correlation between physical activity and mental workload. The most substantial mental workload was observed in work performance, suggesting that managing household tasks without assistance can be particularly challenging. Despite these demands, the study suggests that life satisfaction among homemakers may not be directly linked to their physical activity or mental workload, indicating the need for further research to explore the factors contributing to their overall well-being.

CONFLICT OF INTEREST

This writing does not include any conflicts of interest.

AUTHOR CONTRIBUTIONS

SWI: Conceptualization, methodology, data visualization, analysis, writing–original draft, writing–review, and editing. RM: Manuscript review and Proofreading

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