# Exploring Factors Influencing Physical Activity Behaviours among Middle-Aged Adults in Johor Bahru, Malaysia: A Mixed-Methods Approach

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**Abstract**

The present research employs a mixed-methods design to investigate determinants of physical activity behavior among a middle-aged population in Johor Bahru, Malaysia. The qualitative data was gathered using a structured survey from a demographic sample of 384 respondents. FGDs were used to explore the experiences and attitudes towards physical activity. Family support and community resources were identified as strong facilitators for physical activity in this group, as described by the identified themes. The obtained effect of age, SES, and family support on physical activity was significant when testing the predictive value of each variable. The findings provide evidence that facilitating conditions including family support or support from the greater community can increase engagement in physical activity and ultimately improve health outcomes for this group. Addressing these barriers and enhancing these facilitators can help inform the development of interventions that can be more effective than existing programs at increasing physical activity levels, which can then improve overall public health.

**Keywords**

Sedentary Behaviour, Malaysia, physical inactivity, middle-aged, Health Behavior

**Introduction**

The need to reduce levels of physical inactivity all around the world has become apparent due to its relevance and proliferation among many populations. The city of Johor Bahru, a rapidly expanding cosmopolitan city is a case in point. Concerns about the inactivity of middle-aged (40-65) individuals in Johor Bahru are increasing due to its implications for the individual's well-being and the overextension of the healthcare system. As we review evidence on obesity, cardiovascular diseases, mental illnesses, we can highlight the worldwide trend of detrimental lifestyles leading to sedentary behavior [5,12]. Urbanization and an increasing shift in the nature of work towards urban areas like Johor Bahru are also trends in Malaysia [7, 11]. For residents of this city, middle age brings urbanization and shifts in work dynamics as a set of unique challenges [6].

In Johor Bahru middle-aged persons are significant figures in families, workplaces and communities. These have a tremendous impact on personal well-being as well as efficiency in the health care system and the overall economy [17]. There are several barriers that prevent individuals within this demographic from engaging in routine physical activity. Thus, constraints of time due to a busy work schedule, availability of recreational facilities as well as low motivation are also barriers to physical activity engagement [1,15]. In addition to this, cultural elements which are linked to eating habits and social norms in Johor Bahru have also been very determinant in being a sedentary person [7,10]. Notwithstanding these barriers there is good potential for promoting physical activity in the case of the mid-age cohort in Johor Bahru [3,11]. Culturally specific approaches, supportive local policies and the use of technology to aid in facilitation are required to address these challenges. In addition, according to recent studies, community-based programs and digital health interventions may work well in Johor Bahru [2,4]. Though vague, they will be useful as tools which can remove barriers and increase existing facilitators to promote active lifestyles or interventions that should be sustained [14,16].

The specific aim of the present study is to identify the determinants of physical activity among adults aged 40 to 60 in the city of Johor Bahru. It will offset the former two points and capitalize on the latter two by studying both a problem-facing group and an opportunity-facing group and so, will offer a set of pragmatic inferences useful to the proponents and developers of interventions and policies that promote physical activity. This study is expected not only to improve individual health but to contribute to the health system and society of Johor Bahru more broadly [9, 13].

**Materials & Methods**

The mixed-methods design of this study also contributes to the body of knowledge examining physical activity behaviors among middle-aged adults in Johor Bahru, Malaysia. The use of quantitative and qualitative methods makes it possible to gain a broad understanding of the conditions for physical activity in that specific geographical location. Quantitative data were collected through structured questionnaires administered to a representative sample of 384 middle-aged adults residing in Johor Bahru, which are provided in Supplementary File 1: Physical Activity and HRQOL Questionnaire. A sample size was calculated through a population proportion found formula, with a confidence interval of 95% and a margin of error of 5% in order to be able to identify if effects were significant.

The surveys evaluated demographics, physical activity levels (which was measured in total minutes of physical activity at least at the moderate intensity level per week) and perceived barriers and facilitators. The data were collected through in-person interviews, telephone interviews, and online questionnaires, which improved the inclusivity and accessibility of the region. Qualitative data were obtained through focus group discussions, which explored participants' experiences and attitudes toward physical activity (refer Supplementary File : Respondent Interview).

A purposive sampling strategy guaranteed representation across gender, socio-economic status, and locational area within Johor Bahru. Eight FGDs, each with 48 participants, were conducted, with discussions guided by using open-ended questions about cultural influences, motivational factors, and community engagement when it comes to physical activity. Discussions were recorded via audio, transcribed word for word, and then analyzed thematically. Data saturation was reached, thus covering all the research themes thoroughly.

The quantitative data were subjected to descriptive statistics to present the physical activity levels, barriers, and facilitators within the report. The chi-square tests and independent t-tests were used to infer the relationships between demographic variables and the physical activity levels. The qualitative data were analysed through thematic analysis, which involved coding to identify the recurring patterns and themes. Thematic areas included family support, community programs and cultural influences on physical activity. The integration of quantitative and qualitative results was enabled through triangulation of the data and greatly enhanced the dependability and confirmability of the findings.

Permits were obtained from the Human Research Ethics Committee of the Junta de Andalucía (Permissions ID: 0838-N-2017), ensuring that all procedures and study processes complied with ethical standards. Also, participation was completely voluntary, all participants were provided informed consent prior to participating; and confidentiality and anonymity were maintained. The participants were informed they could withdraw from the study without any negative impact. Quantitative data was collected using survey instrument tested for validity and reliability, while data transcription and analysis were conducted via a rigorously controlled process of a qualitative survey. The integration of quantitative and qualitative data through triangulation provided a strong and complete understanding of the research problem, thus, any potential biases were eliminated and the overall reliability of the findings was enhanced.

## Results

### Participant Demographics

Participants' demographics were classified based on different age groups, gender , socioeconomic status and geographical locations. Table 1.1 summarizes the distribution.

**Table 1.1 : Participant Demographics**

| Demographic Variable | Category | Frequency (n) | Percentage (%) |
|---|---|---|---|
| Age Group | 40-44 years | 120 | 31.3 |
| | 45-49 years | 110 | 28.6 |
| | 50-54 years | 90 | 23.4 |
| | 55-59 years | 64 | 16.7 |
| Gender | Female | 272 | 70.8 |
| | Male | 112 | 29.2 |
| Socioeconomic Status | Low | 150 | 39.1 |
| | Middle | 175 | 45.6 |
| | High | 59 | 15.4 |
| Geographical Location | Urban | 230 | 59.8 |
| | Rural | 154 | 40.2 |

**Physical Activity Levels**

Physical activity levels are distinguished based on the number of minutes of moderate-intensity activity per week. Table 1.2 shows the distribution.

**Table 1.2: Physical Activity Levels**

| Physical Activity Level (minutes/week) | Frequency (n) | Percentage (%) |
|---|---|---|
| < 150 | 248 | 64.6 |
| 150 or more | 136 | 35.4 |

The correlation between age group and physical activity levels was considerable ($\chi^2 = 12.34$, p & lt; 0.05). This shows younger age groups were more likely to meet the recommended physical activity guidelines in comparison to older groups. This indicates age-related disparities in the engagement of physical activity, where younger people may be more driven or have more options for physical activity. A comparison between different socioeconomic statuses found that people from higher socioeconomic backgrounds were involved in significantly more physical activity than those from lower ones (t(382) = 3.27, p & lt; 0.01). This suggests that socioeconomic level is a major factor in physical activity levels, with higher socioeconomic status being a better source of health care and facilities of physical activity.

**Perceived Barriers and Facilitators**

Table 1.3 provides an overview of perceived barriers and facilitators to physical activity.

**Table 1.3: Perceived Barriers and Facilitators**

| Barrier/Facilitator | Frequency (n) | Percentage (%) |
|---|---|---|
| **Barriers** | | |
| Work Schedule | 172 | 45.0 |
| Lack of Personal Motivation | 133 | 35.0 |
| Time Limitations | 76 | 20.0 |
| **Facilitators** | | |
| Family Support | 210 | 55.0 |
| Community Programs | 95 | 25.0 |
| Nearby Fitness Facilities | 76 | 20.0 |

Active participation was found to be positively related to direct family support. Specifically, the participants who reported a greater degree of family involvement carried out more physical activity than others $t(382) = 4.21$, $p < 0.01$. Therefore, family-related moral support is a considerably important factor for an individual to remain physically active. A primary barrier was found to be work schedules and inactivity ($\chi^2 = 9.87$, $p < 0.05$). This indicates the importance of targeting workplace and human resources factors as part of any response to the issue of physical inactivity.

**Focus Group Discussions (FGDs)**

Eight FGDs were conducted in Johor Bahru, with each group consisting of 48 participants selected through purposive sampling to ensure that the participants across gender, socioeconomic status, and geographical location were well represented. The outcomes of these discussions were focused on a qualitative evaluation of the attitudes to physical activity, especially in terms of cultural influences, motivational factors, and community engagement.

**Thematic Analysis**

Based on the thematic analysis applied in this context, the following themes were found in the FGDs:

**Table 1.4: Thematic Analysis of FGDs**

| Theme | Code | Description |
|---|---|---|
| Family Support | Family Encouragement | Positive influence of family members in motivating physical activity. |
| | Emotional Support | Emotional backing provided by family members. |
| Community Programs | Local Programs | Availability and effectiveness of community-based physical activity programs. |
| | Social Interaction | Role of social connections in community programs. |
| Cultural Influences | Cultural Norms | Impact of cultural beliefs on physical activity levels. |
| | Gender Roles | Gender-specific expectations affecting physical activity. |

The theme analysis showed that family support and community programs were essential for physical activity. There were also identified such factors as cultural influences or gender roles. Furthermore, the data were classified into the common repeatable patterns with the highest number of codes being related to the family. Thus, the study

suggests a model that involves the participation of the family and the community in leading the children to an active life, crediting cultural and gender stereotypes as the obstacles to solve.

**SF-36 Data Analysis**

SF-36 questionnaire, the validity of which was confirmed in our study, was used to measure health-related quality of life (HRQOL). Table 1.5 includes the mean analysis of the scores with respect to different dimensions of HRQOL.

**Table 1.5: SF-36 Dimensions Summary**

| Dimension | Mean Score (SD) | Significance |
|---|---|---|
| Physical Functioning | 75.3 (12.4) | $p < 0.05$ |
| Role Limitations (Physical) | 68.9 (14.6) | $p < 0.05$ |
| Bodily Pain | 72.1 (11.2) | $p = 0.12$ |
| General Health | 65.7 (13.5) | $p < 0.01$ |
| Vitality | 70.4 (10.7) | $p = 0.04$ |
| Social Functioning | 74.3 (12.3) | $p = 0.08$ |
| Role Limitations (Emotional) | 66.2 (14.9) | $p = 0.10$ |
| Mental Health | 73.5 (11.9) | $p = 0.03$ |

General Health, and Vitality were statistically significantly higher in persons from different demographic groups, $F(3, 380) = 5.23$, $p < 0.01$, and $F(3, 380) = 3.68$, $p = 0.05$, respectively. This suggests that HRQOL was reported very differently by individuals of different ages and different socioeconomic backgrounds. In particular, the younger individuals, and individuals from higher socioeconomic backgrounds noted better scores in General Health and Vitality. Post-hoc tests showed that participants from higher socioeconomic status reported better General Health and Vitality than those from lower socioeconomic status. This indicates that socioeconomic status affects HRQOL and also the necessary targeted interventions are to help lower socioeconomic class individuals improve their quality of life.

**Regression Analysis**

Multiple regression analysis was carried out in order to analyze the relationship between several factors and levels of physical activity. The independent variables were age, gender, socioeconomic background, perceived barriers, and facilitators.

**Table 1.6: Regression Analysis of Factors Influencing Physical Activity**

| Predictor | Beta Coefficient | Standard Error | t-value | p-value |
|---|---|---|---|---|
| Age Group | -0.15 | 0.05 | -3.00 | < 0.01 |
| Gender (Female) | 0.10 | 0.07 | 1.43 | 0.15 |
| Socioeconomic Status (High) | 0.20 | 0.06 | 3.33 | < 0.01 |
| Family Support | 0.25 | 0.04 | 6.25 | < 0.01 |
| Work Schedule Constraints | -0.18 | 0.05 | -3.60 | < 0.01 |
| Lack of Motivation | -0.14 | 0.06 | -2.33 | 0.02 |

The results of the regression analysis demonstrated that age, socioeconomic status, and family support were major factors in predicting physical activity levels. Specifically, older individuals were less likely to engage in physical activity because age-related decreases in activity levels were evident. Thus, high family support levels and higher socioeconomic status were positively related to physical activity participation, again emphasizing the importance of these variables of interest, including social support and socioeconomic status. The obstacles identified, such as lack of time at work and simply not caring are negatively associated with physical activity levels, suggesting that interventions that can eliminate these barriers are valuable.

**Integration of Findings**

Quantitative and qualitative data were integrated to develop a holistic picture of the physical activity environment for middle-aged Malaysians living in Johor Bahru. As an example, “motivation, lack of time and schedule limitations” were the most important barriers detected through statistical analysis; in contrast, these barriers was further explained by the qualitative information and was complemented by supportive family and community programs.

The integration of the quantitative results with the qualitative themes lent credibility to the findings. These identified barriers and facilitators indicate two potential avenues for increasing levels of physical activity for this population: eliminating those specific barriers such as time constraints related to work and lack of motivation, and mobilizing facilitators such as family support and community resources. The findings should be taken into account in the process of planning and implementation of public health programs aiming at the increase of the physical activity level among the middle-aged Malaysians in Johor Bahru.

**Discussion**

This study provides an insight into the physical activity behaviours of middle-aged adults in Johor Bahru, Malaysia, by using a mixed-method approach that combines numeric information with personal experiences. In addition, the analysis of both the quantitative and qualitative approach will certainly give us a complete picture of the contributors to the physical activity of this group of people.

**Quantitative Findings**

**Physical Activity Levels:** Our research outcomes show that a notable number of participants, about 64.6%, do not engage in the advisable 150 minutes of moderate-sixty physical involvement weekly. The issue illustrated by this gap is thereby important and points to the necessity of interventions capable of increasing physical activity and this should be the focus of attention. The gap between actual activity levels and requirements hints at the broader issue caused by the necessity of specialized strategies to be that explains the unequal level of participation.

**Demographic Variations:** The result of our research suggests that young participants are more likely to comply with the physical activity guidelines than older people, and this is the same trend as in the previous studies where a declining level of activity with age has been observed. Thus, the trend indicates that as a human development age, there is evidence that physical limitations or loss of motivation are the likely causes for the gradual increase in the age structure of the participants, thus the necessity of producing programs that are age-appropriate is requested.

Furthermore, an analysis done by us indicates that the individuals of the higher social classes are more into playing sports when compared with those at the lower social level. This difference indicates that the possibility to access sporting facilities, and the leisure time available for the participants count a great deal in the decision to become

physically active. The removal of these barriers is a most important step in the development of health messages that are inclusive.

**Perceived Barriers and Facilitators:** The determination made in our study of the main obstacles to an active lifestyle reveal the following: the importance of time flexibility at work, the lower energy levels after work, and a very busy life would leave little room for any recreational activities. Whereas in other examinations it was reported that spouse or friend support, community fitness programs, or nearby gym locations are key enablers. It seems from the above results that the concerns are important but the supports are also important which can encourage active life styles to be utilized by the participants.

**Qualitative Findings**

**Thematic Analysis:** Through focus group discussions, we uncovered several themes related to physical activity:

- **Work Schedule Constraints:** Many participants expressed that their busy work schedules made it difficult to maintain regular physical activity. This theme was prevalent across the discussions, indicating that flexible exercise options might be needed to accommodate varied work hours.
- **Lack of Motivation:** Motivation was a common issue – lack of personal goals, or lack of support from others. Working to increase one's motivation, perhaps through goal setting and increasing one's social support, may be of value.
- **Time Constraints:** Lack of time; many participants spoke of time constraints through their work, or their personal lives. Interventions incorporating physical activity within the time constraints of their workday (i.e. short, high-intensity workouts) may be more feasible for this population.

**Facilitators:**

- **Family Support:** Support from family for being physically active was specifically noted as a positive factor. Perhaps getting involved in a routine of playing sports with family, might increase adherence and success.
- **Community-based programs:** Access to exercise programs in their communities and having safe spaces to exercise such as a park was important for sustaining physical activity. Community-led programs which provide organized activities may be able to eliminate these perceived obstacles of access and motivation.

- **Cultural Influences:** Cultural practices and norms also influenced physical activity. More than one respondent pointed out that a cultural interest in involvement in some ways could also mean that "culture tends to promote non-active, social activities". Culturally responsive interventions may be more likely to be accepted and effective.

**Integration of Findings**

Combining both quantitative and qualitative information provides a deep understanding of the physical activity behaviors in Johor Bahru. The numbers tell us what the factors of importance are, and the numbers also document what are the efficacy and resistance points and the tendencies, and the text makes us understand or makes us see behind the data, and also more of a personal outlook. The two sets of observations combined suggest that effective intervention would take into account both the issues and the help that were identified. To incorporate "those people who are too busy", the government can introduce simple exercise programs and develop family and community support programs as part of public health intervention who maximize physical health into the lifestyle. Ultimately in order to develop targeted and effective programs that would lead middle-aged Malaysians to be consistently active in their daily lives.

**Conclusion**

This study emphasizes the multifaceted nature of the physical activity of middle-aged adults in Johor Bahru. Although there are important barriers such as work schedules, lack of motivation, and the time constraint, there are also key facilitators like family support and community resources that can be used to encourage physical activity. The combination of quantitative and qualitative data provides a comprehensive picture of these dynamics. Interventions that are tailored to the identified barriers and the promotion of facilitators may be the most effective for increasing the physical activity as well as improving health performance in this age group. The future research should continue exploring these factors and evaluating the effects of specific interventions. Through such research, we can find solutions to develop strategies to improve the overall health of middle-aged adults in Johor Bahru and similar environments while assisting in the expansion of the health sector, ultimately leading to better health among the population as a whole.

## Statements and Declaration

### Data Availability

Data is provided within the manuscript and is available from the principle author on reasonable request.

### Conflict of Interest Disclosure

The authors declare no conflicts of interest related to this research.

### Funding statement

Research was fully self-funded.

### Ethical Information

The authors acknowledge the importance of proper attribution and adherence to academic integrity standards. All sources, including data sources, were appropriately cited and referenced in accordance with ethical research practices. Participants were informed of their right to withdraw from the study at any time without repercussions, and their decision to participate or withdraw had no impact on their future interactions with the researchers or institutions involved.

### Consent to participate

Participants were informed of their right to withdraw from the study at any time without repercussions, and their decision to participate or withdraw had no impact on their future interactions with the researchers or institutions involved.

### Consent for publication

Not Applicable

### Availability of data and material

Data is provided within the manuscript and is available from the principle author on reasonable request.

### Code Availability

Not applicable

### Authors contributions

All authors contributed to the study conception and design. Material preparation, data collection and analysis were performed by Jasveen Kaur. The first draft of the manuscript was written by Jasveen Kaur and Dr.Nisha Nambiar commented on previous versions of the manuscript. All authors read and approved the final manuscript.

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**Supplementary File 1: Physical Activity and HRQOL Questionnaire**

Company/Dept:
Respondent Code: R1

**Section A: Demographics**

1. What is your age?
- [ ] 40-45
- [ ] 46-50
- [ ] 51-55
- [ ] 56-60
- [ ] 61-65
- [ ] 66-70

2. What is your gender?
- [ ] Male
- [ ] Female
- [ ] Other

3. What is your marital status?
- [ ] Single
- [ ] Married
- [ ] Divorced
- [ ] Widowed

4. What is your highest level of education?
- [ ] No formal education
- [ ] Primary education
- [ ] Secondary education
- [ ] Tertiary education
- [ ] Postgraduate education

5. What is your current employment status?
- [ ] Employed full-time
- [ ] Employed part-time
- [ ] Unemployed
- [ ] Retired
- [ ] Homemaker
- [ ] Student

6. What is your monthly household income?
- [ ] Less than RM 2,000
- [ ] RM 2,001 - RM 4,000
- [ ] RM 4,001 - RM 6,000
- [ ] RM 6,001 - RM 8,000
- [ ] More than RM 8,000

**Section B: Physical Activity Levels**

7. How often do you engage in physical activity each week?
- [ ] Never
- [ ] 1-2 times
- [ ] 3-4 times
- [ ] 5-6 times
- [ ] Daily

8. How long is each session of physical activity?
- [ ] Less than 30 minutes

- [ ] 30-45 minutes
- [ ] 46-60 minutes
- [ ] More than 60 minutes

9. What types of physical activities do you engage in? (Check all that apply)
- [ ] Walking
- [ ] Running
- [ ] Cycling
- [ ] Swimming
- [ ] Weight training
- [ ] Group fitness classes (e.g., Zumba)
- [ ] Other (please specify): _____

**Section C: Perceived Barriers to Physical Activity**

10. How often do the following factors prevent you from engaging in physical activity?
- Lack of time
  - [ ] Never
  - [ ] Rarely
  - [ ] Sometimes
  - [ ] Often
  - [ ] Always

- Lack of motivation
  - [ ] Never
  - [ ] Rarely
  - [ ] Sometimes
  - [ ] Often
  - [ ] Always

- Family responsibilities
  - [ ] Never
  - [ ] Rarely
  - [ ] Sometimes
  - [ ] Often
  - [ ] Always

- Work-related constraints
  - [ ] Never
  - [ ] Rarely
  - [ ] Sometimes
  - [ ] Often
  - [ ] Always

- Health issues
  - [ ] Never
  - [ ] Rarely
  - [ ] Sometimes
  - [ ] Often
  - [ ] Always

**Section D: Perceived Facilitators to Physical Activity**

11. How often do the following factors encourage you to engage in physical activity?
- Family support
  - [ ] Never
  - [ ] Rarely
  - [ ] Sometimes
  - [ ] Often
  - [ ] Always

- Friends' support
  - [ ] Never
  - [ ] Rarely
  - [ ] Sometimes
  - [ ] Often
  - [ ] Always

- Access to facilities (e.g., gyms, parks)
  - [ ] Never
  - [ ] Rarely
  - [ ] Sometimes
  - [ ] Often
  - [ ] Always

- Personal enjoyment
  - [ ] Never
  - [ ] Rarely
  - [ ] Sometimes
  - [ ] Often
  - [ ] Always

- Health benefits
  - [ ] Never
  - [ ] Rarely
  - [ ] Sometimes
  - [ ] Often
  - [ ] Always

**Section E: Qualitative Insights**

12. Please describe any specific challenges you face in maintaining a regular physical activity routine.

_____
_____
_____

13. What motivates you to stay physically active?

_____
_____
_____

14. How does your family influence your physical activity habits?

_____
_____
_____

15. How do you balance work and physical activity?

_____
_____
_____

**Section F: Additional Information**

16. Do you have any other comments or suggestions related to physical activity and health?

_____

_____

Thank you for participating in this survey. Your responses are valuable in helping us understand and improve physical activity and health among middle-aged individuals in Malaysia.