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Effects of Prolonged Sitting Habits of the Office Workers in Catmon Municipal Hall: Some Interventions

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***Abstract*: This study sought to investigate the effects of prolonged sitting for extended periods of time has on employees working in the office of Catmon Municipal Hall. The study employed mix-method approach to understand the prolonged sitting patterns, and the data was collected through a survey questionnaire that utilized a Likert Scale. The findings revealed that the average mean time of prolonged sitting in the office workers at Catmon Municipal Hall is 6.7 hours and it was found that there was a significant relationship between prolonged sitting for extended periods and experiencing ergonomic pain in an office setting. This research provided useful insights that can be utilized in the formulation of policies that promote healthier working environment.**

***Keywords*: ergonomics, health consequences, musculoskeletal discomfort, physical activity, sedentary behavior, sitting breaks.**

1. Introduction

The contemporary work environments have transformed job dynamics, encouraging a shift from active to sedentary roles. As we transition into an era characterized by high industrialization and advanced robotics, sedentary employment has become increasingly prevalent (Rezwan et al. 2023).

In the bustling world of municipal work, office workers are confronted with sedentary lifestyles characterized by prolonged periods of sitting. The widespread patterns of this professional conduct have sparked apprehension because of the possible negative impacts on physical and mental health.

Sedentary behavior is defined as any period of being awake where the amount of energy used is the same as or less than 1.5 equivalents of metabolism (METs) while sitting down, reclined, or lying position. Essentially, whenever an individual is sitting or lying down, they are participating in sedentary behavior. Further, Sedentary behavior is also linked to poor vascular function and structure, as well as an increased risk of cardiovascular diseases (CVD) in both healthy and symptomatic populations (Carter et al., 2017).

A local study showed a 57% prevalence among employees, most of whom have sedentary work (Degay, 2019). The overall amount of sedentary time per day has been linked to an increased risk of cardiometabolic disorders; increasing sitting time at work has been linked to musculoskeletal discomfort. Since office workers sit for lengthy periods, initiatives to improve movement through posture modifications (sit to stand) or moving while sitting are recommended to offset the adverse effects of prolonged sitting.

A charity organization called Just Stand has outlined distinct risk categories based on the duration of sitting. Individuals who sit for less than 4 hours per day fall into the low-risk category; those sitting for 4–8 hours daily are considered at medium risk. The high-risk category includes individuals sitting for 8–11 hours per day, while those sitting for more than 11 hours daily are categorized as very high risk. These thresholds provide a framework to evaluate and communicate the potential health risks associated with varying durations of sitting.

As contemporary office demands change, it becomes crucial to comprehend the nuanced repercussions of prolonged sitting for the well-being of municipal office workers. According to (Cardoso et al., 2018), there is an identified association between extended periods of sitting and musculoskeletal discomfort. The study highlights various areas where individuals may experience such discomfort, encompassing the neck, shoulders, lower limbs, lower back, buttocks, thighs, wrists, and hands. These findings emphasize the diverse impact of prolonged sitting on different body parts, shedding light on potential areas of concern related to sedentary behavior.

The rise in non-communicable diseases (NCDs) has brought sedentary behavior to the forefront as a significant public health issue (Rawlings et al., 2019). Prolonged periods of sitting without engaging in physical activity can elevate the likelihood of various health issues, such as heart conditions, type 2 diabetes, and certain types of cancer. Moreover, sitting for extended periods has a cost. The act of being physically inactive has been associated with a range of negative health outcomes, such as cardiovascular, metabolic, and musculoskeletal disorders, as well as higher rates of overall sickness and mortality (Carter et al., 2017). The World Health Organization (WHO, 2020) indicates that approximately 3.2 million

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individuals across the globe experience premature mortality annually as a result of leading a sedentary lifestyle.

This research seeks to ascertain concerning the office workers at Catmon Municipal Hall and concurrently analyze the effects of their habitual extended periods of seated work at their respective workstations. The primary objective was to assess the prevailing patterns of sedentary behavior among office workers whether there exists a notable correlation between extended periods of sitting and ergonomic discomfort in an office workspace resulting to its associated adverse effects. The study offered valuable insights that can inform the formulation of workplace interventions and policies, fostering a work environment at Catmon Municipal Hall that is conducive to the well-being and dynamism of its office workers.

2. Materials and Methods

A mixed-methods approach was used in the study on prolonged sitting patterns in the Municipal Hall in Catmon, Cebu. Observation and structured survey methods were used in data collecting. Concurrently, a questionnaire was given to collect subjective opinions about sedentary behavior, including elements affecting extended sitting. The questionnaire used was adapted from a study of Lurati (2018) where it tackles workplace health & safety concerning health issues and injury risks associated with prolonged sitting and sedentary lifestyles; the same Likert Scale was employed. The purpose of the observations and survey questionnaire was to measure how long and how often employees of the municipal hall sat for extended periods. In addition, all data gathered are encoded with the use of Microsoft Excel and it is also computed and compiled using SPSS software.

A. Environment and Participant

The study was conducted at Catmon Municipal Hall. It is located at Catmon, Cebu 6006, one of the municipalities in Cebu Province. The researchers randomly chose their respondents from the municipal office workers. The researchers chose to conduct their study at Catmon Municipal Hall because it has enough population of workers that will give the researchers the data they wanted to gather. Also, conducting their study there will not be hard for them since their respondents are accessible. It is more convenient for the researchers and will not consume most of their time which will lead to fast accomplishment of the study.

The participants in this study consisted of individuals employed in office settings. This research study employed a multi-stage sampling method, specifically using purposive sampling based on the following inclusion criteria: (a) being an office worker at Catmon Municipal Hall, (b) possessing the ability to hear, speak, and understand, and (c) being able to comprehend and speak English, Filipino, and Bisaya. Additionally, quota sampling was utilized to ensure the involvement of at least 30 participants.

The table 1 illustrates the corresponding number of respondents that had been gathered upon the total number of office workers in Catmon Municipal Hall to anticipate at what level of percentage had been garnered.

Table 1
Number of respondents

Respondents	
Number of Office Workers	59
Number of Respondents	35
Percentage of Respondents	59.32%

B. Data-Gathering Tools and Study Procedure

Two significant processes were followed to conduct the study properly: the Pre- Data Gathering and the Data gathering and analysis. The Pre-Data Gathering involved the writing of a permission letter to be approved by the research instructor, Industrial Engineering Chairman, and as well as the Municipal Mayor of Catmon. Upon the approval of the request, a ready-made survey questionnaire was prepared and modified that would be apt for the researchers' study. After validating the survey questionnaire, the researchers proceeded to the municipal hall. The survey questionnaire comprised demographic inquiries and 11 inquiries assessed on a 5-point Likert scale for part 1 and 12 questions for part 2 with choices to measure the frequency distribution of the given choices relating to health consequences of the participants' prolonged sitting experience. The goal was to gather at least 30 responses and to let participants answer for 5-10 minutes. In total, 35 employees responded, hence only 30 participants did continue in answering as the other 5 ended within the demographic questions only.

C. Statistics & Scoring Procedure

The statistical method was used for faster and more accurate quantitative data analysis. The data gathered from the 5-point Likert survey questionnaire or the workers' responses were consolidated in a spreadsheet or Microsoft Excel. A Descriptive Analysis, specifically the weighted mean, was used to interpret the workers' perceptions of prolonged sitting. Based on the findings, the development of workplace interventions and policies, promoting a work environment that is healthier can be proposed.

The respondents were instructed to evaluate each question using a Five-Point Likert scale procedure, with five as the highest and one as the lowest. The employees' perception of their prolonged sitting was scored and categorized based on the following basis as shown in table 2.

Table 2
The scoring of the perceptions of the respondents in prolonged sitting

Weight	Range	Category	Description
5	4.21-5.00	Strongly Agree	The respondent felt very much discomfort or issues in his/her prolonged sitting.
4	3.41-4.20	Agree	The respondent felt much discomfort or issues in his/her prolonged sitting.
3	2.61-3.40	Neutral	The respondent felt discomfort or issues in his/her prolonged sitting.
2	1.81-2.60	Disagree	The respondent felt a little bit of discomfort or issues in his/her prolonged sitting.
1	1.00-1.80	Strongly Disagree	The respondent felt no discomfort or issues in his/her prolonged sitting.

Table 2 presents the description of the scaling factor of the office workers perception upon their discomfort in their workspace.

3. Results

This section provides an analysis and interpretation of the data collected in the study. The purpose is to determine the average duration of prolonged sitting among the respondents, based on the frequency of their prolonged sitting hours during a typical workday. Additionally, it examines the perception of prolonged sitting among office workers at Catmon Municipal Hall.

A. Respondents Mean Time of Prolonged Sitting

Table 3
Catmon office workers mean time in prolonged sitting

Mean Time of the Respondents Prolonged Sitting	6.7 Hours

In the Table 3, it summarizes the average mean time of prolonged sitting of the office workers in Catmon Municipal Hall through getting their mean average of sitting for an extended period of time daily in a workspace.

B. Workers' Perceptions of Prolonged Sitting

This section presented the summary of results of part 1 questionnaire obtained from excel. The collated data interpreted all eleven questions by calculating the weighted mean. The table summarizes the results of the queries to analyze the office worker's prolonged sitting behavior.

Table 4 illustrates the result of each identified situations for the workers to perceive the issues in prolonged sitting. It also delves with the overall mean garnered that the workers felt discomfort or issues in their prolonged sitting.

C. Relationship Analysis

In this section, the analysis of the connection between situational questions and the duration of prolonged sitting among workers. The data was subjected to statistical calculation with the used of Pearson Product Moment Coefficient of Correlation. The table provided a concise summary of the outcomes, indicating whether a significant relationship exists or if the association between the variables is deemed not significant.

D. Effects of Prolonged Sitting

This section presented the summary of the results of the part 2 questionnaire obtained from Excel. The collated data interpreted all twelve questions by calculating the frequency distribution in that the majority aspect respondents had chosen.

Table 6 & 7 presents the effects of prolonged sitting that office workers have experienced. It also highlights the necessity for intervention, as the data collected summarizes the negative

Table 4
Workers' perceptions of prolonged sitting

No.	Situational Questions	Mean	Description
1	I'm energized after sitting for a long period of time.	2.74	The respondent felt discomfort or issues in his/her prolonged sitting.
2	My workload contributes to prolonged sitting	3.26	The respondent felt discomfort or issues in his/her prolonged sitting.
3	I feel discomfort or issues in prolonged sitting.	2.77	The respondent felt discomfort or issues in his/her prolonged sitting.
4	My furniture is flexible to adjust and rearrange as per my needs.	3.03	The respondent felt discomfort or issues in his/her prolonged sitting.
5	I adjusted my workspace to improve ergonomics conditions.	3.17	The respondent felt discomfort or issues in his/her prolonged sitting.
6	I can manage long sitting.	2.89	The respondent felt discomfort or issues in his/her prolonged sitting.
7	I stay healthy while sitting all day.	2.37	The respondent felt a little bit of discomfort or issues in his/her prolonged sitting
8	Prolonged sitting results in back pains.	3.31	The respondent felt discomfort or issues in his/her prolonged sitting.
9	Furniture (table, chair, etc.) is comfortable that I can work without getting tired for 8 or 9 working hours in a day while sitting	2.83	The respondent felt discomfort or issues in his/her prolonged sitting.
10	Working long hours while sitting affects my health	3.11	The respondent felt discomfort or issues in his/her prolonged sitting.
11	I encounter problems (fatigue, stress, stiffness) in prolonged sitting	3.00	The respondent felt discomfort or issues in his/her prolonged sitting.
	OVERALL MEAN = 2.95		**The respondent felt discomfort or issues in his/her prolonged sitting.**

Table 5
Summary of correlation between questions and no.of hours

Variables	Tabular r- Value	Computed r- Value	Correlation
Question 1 & Hours	0.4182	0.613	Significant Relationship
Question 2 & Hours	0.4182	0.746	Significant Relationship
Question 3 & Hours	0.4182	0.709	Significant Relationship
Question 4 & Hours	0.4182	0.738	Significant Relationship
Question 5 & Hours	0.4182	0.743	Significant Relationship
Question 6 & Hours	0.4182	0.701	Significant Relationship
Question 7 & Hours	0.4182	0.626	Significant Relationship
Question 8 & Hours	0.4182	0.738	Significant Relationship
Question 9 & Hours	0.4182	0.631	Significant Relationship
Question 10 & Hours	0.4182	0.709	Significant Relationship
Question 11 & Hours	0.4182	0.716	Significant Relationship

Table 6
Effects of prolonged sitting habits

Question Category	Mean	Description
Feelings after prolonged sitting.	1.4	The respondents felt moderately fatigue.
Discomfort or health issue due to prolonged sitting.	1	The respondents felt a mild discomfort of health issues due to prolonged sitting.
Back pains due to prolonged sitting	1.5	The respondents felt back pains occasionally due to prolonged sitting.

effects they have met.

Table 7
Effects of prolonged sitting habits

Question Category	Choice	Percentage rate
Workspace Ergonomics Adjustments	Yes	48%
	No	14%
	Partially	38%
Management of Long Sitting	Regular Breaks	50%
	Stretching Exercises	50%
	Ergonomic Furniture	0%
	Standing Desk	0%
Staying Healthy While Sitting	Regular Exercise Routine	53%
	Healthy Snacking	6%
	Hydration	23%
	Posture Awareness	18%
Reducing Effects of Prolonged Sitting	Regular Breaks	66%
	Stretching Exercises	31%
	Ergonomic Furniture	0%
	Standing Desk	3%
Effects of Prolonged Sitting	Back Pain	64%
	Neck Pain	12%
	Fatigue	12%
	Poor Circulation	12%
Symptoms of Long Sitting	Stiffness	35%
	Numbness	29%
	Tingling	3%
	Muscle Soreness	32%
Problems Caused by Long Hours	Sleep Disturbance	24%
	Stress	43%
	Weight Gain	24%
	Reduced Productivity	9%
Health Effects of Long Hours	Physical Fatigue	44%
	Mental Fatigue	15%
	Increased Stress	15%
	Eye Strain	26%

4. Discussion

The results at Table 3 revealed that the average mean time of prolonged sitting for office workers at Catmon Municipal Hall was 6.7 hours. Hence, this research establishes the concept of prolonged sitting as a state of staying inactive with minimum physical activity within the workstation for a duration of 6.7 hours. The result was further supported by Peereboom and de Langen (2021) in their study for the European Agency for Safety and Health at Work with regards to prolonged static sitting at work which effects health and in need for good practice advice. The study focuses on the negative health consequences of prolonged periods of sedentary sitting in the workplace. And it provides a definition of prolonged sitting as participating in sedentary activities for a continuous period of 2 hours or longer. It emphasizes three main characteristics associated with this behavior: low energy expenditure, a seated body position, and static loading, which requires physical effort to maintain the same posture. The mean time garnered of the worker's prolonged sitting average time also belongs to the identified medium risk category of the Just Stand Organization where they identified that sitting for 4-8 hours daily are considered at medium risk.

It was determined in Table 4 that a calculated overall mean of 2.95 for the eleven situational questions indicated that the majority of office workers at Catmon Municipal Hall experienced discomfort or difficulties with prolonged sitting. Kett and Sichting (2019) found that individuals who sit for extended periods are at risk for musculoskeletal discomfort and back pain.

As measured by a mean of 2.37, the majority of office workers were in opposition to situation number 7. As a result, they experienced some degree of unease or difficulty during extended periods of seating due to their conviction that sitting throughout the day does not promote good health. Furthermore, their neutral responses are from situations 1, 2, 3, 4, 5, 6, 8, 9, 10, and 11 indicate that 86% of them experienced discomfort or difficulties as a result of their prolonged sitting. However, they are content with the current furniture arrangement because it is adaptable and can be rearranged to suit the requirements of the employees. Nonetheless, the same proportion of employees throughout the workday due to the difficulties in some of regions of their body presumably in their low back, buttocks, upper back, thigh, and neck as they encountered discomfort while seated for extended periods of time had led to back pains and frequently caused fatigue, tension, and stiffness which contributed to the development of adverse physiological outcomes.

This was further supported with the resulted correlation between the number of hours of prolonged sitting and the situations that violated the ergonomics principles that had been shown on Table 4. Each identified situation demonstrated a significant relationship with the overall time spent by office workers in a seated position. The discomfort experienced by office workers during prolonged sitting is notably pronounced, with a clear correlation indicating that the longer the hours spent sitting, the greater the level of discomfort they can experience. This connection underscores the adverse effects of extended sedentary behavior on the well-being of office workers

The assessment of office workers' experiences with prolonged sitting reveals a nuanced landscape of post-sitting feelings, workload contributions, and associated discomfort or health issues which can be seen in Table 6. A significant portion with a mean of 1.4, reported feeling moderately fatigued after sitting for extended periods, while the discomfort or health issues associated with prolonged sitting were varied has a mean of 1 experiencing mild discomfort. Interestingly, 48% of respondents adjusted their workspace ergonomics, highlighting a proactive approach to enhancing comfort. Strategies for managing long sitting included stretching activities and regular breaks, each employed by 50% of respondents. Furthermore, the prevalence of back pain has a mean of 1.5 and various effects such as poor circulation and fatigue were documented. The findings underscore the need for a holistic approach encompassing ergonomic adjustments, workload management, and healthy habits to alleviate the multifaceted consequences of prolonged sitting in the workplace

Considering the results, it is recommended to carry out a comprehensive intervention approach to address the prevalent issue of prolonged sitting and the associated discomfort among municipal office workers in Catmon Municipal Hall. Essential methods include prioritizing the design of ergonomic workstations, integrating adaptable furniture, as well as

encouraging regular movement breaks through awareness initiatives. Adopting workplace health policies, such as the incorporation of active workstations like standing desks, offers alternatives for prolonged periods of sitting. Implementing inclusive staff wellness programs that include physical fitness activities and mental health initiatives promotes a comprehensive and all-encompassing approach to overall well-being. Implementing flexible work schedules, which include brief breaks and opportunities for physical activity, fosters a dynamic work environment. Regular health check-ups perform as a proactive strategy, overseeing employees' physical well-being and offering options for preventive treatment, including coordination with the Municipal Rural Health Unit. The primary objective of this comprehensive intervention method is to foster a work environment that promotes healthier habits, diminish sedentary behavior, and improve the overall well-being and efficiency of municipal office employees.

5. Conclusion

In conclusion, office workers at Catmon Municipal Hall exhibit a sedentary behavior with an average sitting time of 6.7 hours. Every identified situation displayed a significant situation with the duration of office workers in prolonged sitting and may lead to a gradual increase in discomfort among healthy workers. The occurrence of discomfort was seen to align with elevated contact pressures in different body areas, resulting individuals experiencing back pain following extended periods of sitting, which enables it to contribute to the development of musculoskeletal illnesses. This association between prolonged sitting and ergonomic lapses sheds light on the importance of adhering to ergonomic principles to mitigate the adverse effects of prolonged sitting in the workplace, emphasizing the need for interventions or ergonomic adjustments to mitigate discomfort associated with prolonged sitting.

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