Saudi Arabian Office Workers Ergonomic Assessment and Occupational Therapy Awareness

[1*]Senthil Vadivel, [2]Christopher Amalraj, [3]Nawaf Al Anezi, [4]Paramasivan Mani, [5]Mohammed Al Mohaini, [6]Mohammed Bureesh, [6]Mohammed Alibrahim [6]Abdulrahman Almulhim, [6]Sharidah Al sharidah, [6]Zakaria Alqutayfi

[1]Lecturer in Occupational Therapy, College of Applied Medical Sciences-Al Ahsa, King Saud Bin Abdul Aziz University for Health Sciences, Kingdom of Saudi Arabia, Pin code-36428.
Orcid id-0000-0002-7011-3989
[2]Assistant Professor in Bio-Statistics, Vice Deanship of Development and Community Partnership, College of Medicine, Imam Abdulrahman Bin Faisal University, Dammam, Kingdom of Saudi Arabia, Pin code-31441. **Orcid id-0000-0002-4636-1069**
[3]Dean, College of Applied Medical Sciences-Al Ahsa, King Saud Bin Abdul Aziz University for Health Sciences, Kingdom of Saudi Arabia, Pin code-36428.
[4]Lecturer in Occupational Therapy, College of Applied Medical Sciences-Al Ahsa, King Saud Bin Abdul Aziz University for Health Sciences, Kingdom of Saudi Arabia, Pin code-36428.
Orcid id-0000-3905-7011-8803
[5]Assistant Professor in Basic Sciences, College of Applied Medical Sciences-Al Ahsa, King Saud Bin Abdul Aziz University for Health Sciences, Kingdom of Saudi Arabia,
Pin code-36428. **Orcid id-0000-0002-0185-4484**
[6]Internship Student in Occupational Therapy, College of Applied Medical Sciences-Al Ahsa, King Saud Bin Abdul Aziz University for Health Sciences, Kingdom of Saudi Arabia, Pin code-36428.
[*]**Corresponding Author Name:** Senthil Vadivel
Lecturer in Occupational Therapy, College of Applied Medical Sciences-Al Ahsa, King Saud Bin Abdul Aziz University for Health Sciences, Kingdom of Saudi Arabia, Pin code-36428.
[*]**Corresponding Author Email:** senthilvadivelpalanichamy@yahoo.co.in , vadivus@ksau-hs.edu.sa
Phone number-+966507532042
Orcid id:0000-0002-7011-3989

Emails of co-authors:
[2]cadoss@iau.edu.sa
[3]alanazina@ksau-hs.edu.sa
[4]manip@ksau-hs.edu.sa
[5]mohainim@ksau-hs.edu.sa
[6]bureesh004@ksau-hs.edu.sa
[6]alberahim012@ksau-hs.edu.sa
[6]almulhim100@ksau-hs.edu.sa
[6]alsharidah062@ksau-hs.edu.sa
[6]algatifi018@ksau-hs.edu.sa

Abstract

An ergonomic assessment commonly referred to as an ergonomic risk assessment, identifies workplace risks that could lead to musculoskeletal issues or injuries in your personnel. This study set out to find out whether KSAU-HS (King Saud Bin Abdulaziz University for Health Sciences, Kingdom of Saudi Arabia.) office workers understood the value of ergonomic long sitting. Using a Microsoft form, qualitative and descriptive research design was used to survey long-time Office users. The evaluation was conducted using a single questionnaire (yes or no). There were 430 participants in total and 348 of them completed the survey, yielding an impressive response rate of 81%. The study discovered that office workers' overall perceptions of ergonomics and occupational therapy were at a moderate level. The level of assessment and awareness of ergonomics and occupational therapy among KSAU-HS office workers is moderate. Significance of developing ergonomics in the Kingdom of Saudi Arabia requires more study.

Keywords: occupational therapy, office workers, workplace risk, ergonomic risk assessment, awareness, musculoskeletal problems.

Introduction

The terminology "ergonomics" appears in a variety of literature, ranging from advertising promoting the latest technology to lengthy information in the Occupational Safety and Health Administration's program criteria for industries (American Occupational Therapy Association, 2017)."Ergonomics presents a comprehensive approach that takes into account physical, cognitive, social, organizational, environmental, and other pertinent components are considered," explains the International Ergonomics Association. An ergonomic assessment, also known as an ergonomic risk assessment, focuses on occupational risks that could result in musculoskeletal issues or injuries among labor force members [1]. Recognizing and assessing these risk factors was the main goal of an ergonomic appraisal to provide employees with quantifiable workplace improvements. A thorough ergonomic assessment serves as the cornerstone for creating a workplace that is safer, better, less problematic, and more prosperous overall [2-3]. Giving standing work areas, movable seats and workstations, footstools, ergonomic consoles, and lumbar support are some potential foundational elements for the workplace. Offices should improve the working environment for employees by investing in anti-stress shutters, movable workstations, word-related treatments, and improving the correct seating posture [4-5].Significant improvements are attainable when using a solely micro-ergonomic approach. When a real macro ergonomic approach is used, however, considerably greater advantages in health, safety, and productivity are often feasible. The good news is that most worthwhile ergonomics projects can be justified in terms of economic benefits [6]. Methods for human factor ergonomics are quite important. These methodologies provide the ergonomist with an organized approach to analyzing and evolving design difficulties [7]. The negative effects of stress are numerous and diversified, to the point where many people consider stress to be the primary threat to human well-being in sophisticated industrialized countries [7]. Ergonomics is a scientific discipline concerned with the study of human-system interactions, as well as a profession that use theory, concepts, data, and procedures to improve human well-being and overall system performance. A complicated task for a designer is the science and practice of creating industrial settings to optimize human well-being and system performance [8]. The primary implication of research on economic stress for individuals is to allocate sufficient time and energy to career planning. Choose a vocation after conducting extensive research on the expertise, skill, and abilities (KSAs) required for the occupation, an analysis of one's skills and abilities, an investigation into the occupational outlook for that career, and an understanding of the necessary level of education to enter that occupation [9]. There is a need to broaden the spectrum of factors now considered, as well as to investigate the interconnections between those components currently assessed. In accordance with the ergonomics approach to intervention, evaluation methods that focus primarily on physical elements in the workplace should be supplemented with appropriate ergonomic procedures that address broader organizational difficulties in order to find effective solutions [10]. The basic competency of an occupational therapist, according to AOTA (1), is "optimizing the function of an individual or group of individuals by adjusting the environment in which the person(s) must interact." Because of their training in anatomy, physiology, and activity analysis, occupational therapy practitioners (OTP) are uniquely prepared to work in the field of ergonomics, generally as part of an interdisciplinary team. The occupational therapy practitioner is well-equipped to facilitate the effective return to optimal function for individuals as well as groups of people whose ability to carry out their varied life responsibilities (for example, worker) is hampered by illness or injury, or the risk of such occurrence. Musculoskeletal issues have increasingly spread over the world in recent years. It is a common source of work-related impairment among employees who are struggling financially due to workers' compensation and medical expenditures. The regular use of high-frequency vibration instruments has been linked to mild hand neuropathy. If ergonomic aspects are properly organized, work systems, sports and leisure, and health and safety should all incorporate them. People working in small and medium-sized businesses, where it is common for workstations to be inadequately constructed for ergonomics [11].

Methods

The study was carried out by researchers from King Saud bin Abdulaziz University for Health Sciences(KSAU-HS), Al-Ahsa, campus between September 2021 and December 2021.

Study Design

We were working with categorical data; this research is qualitative. The poll measured the perception and knowledge of ergonomics among office workers. Furthermore, the study was a cross-sectional study.

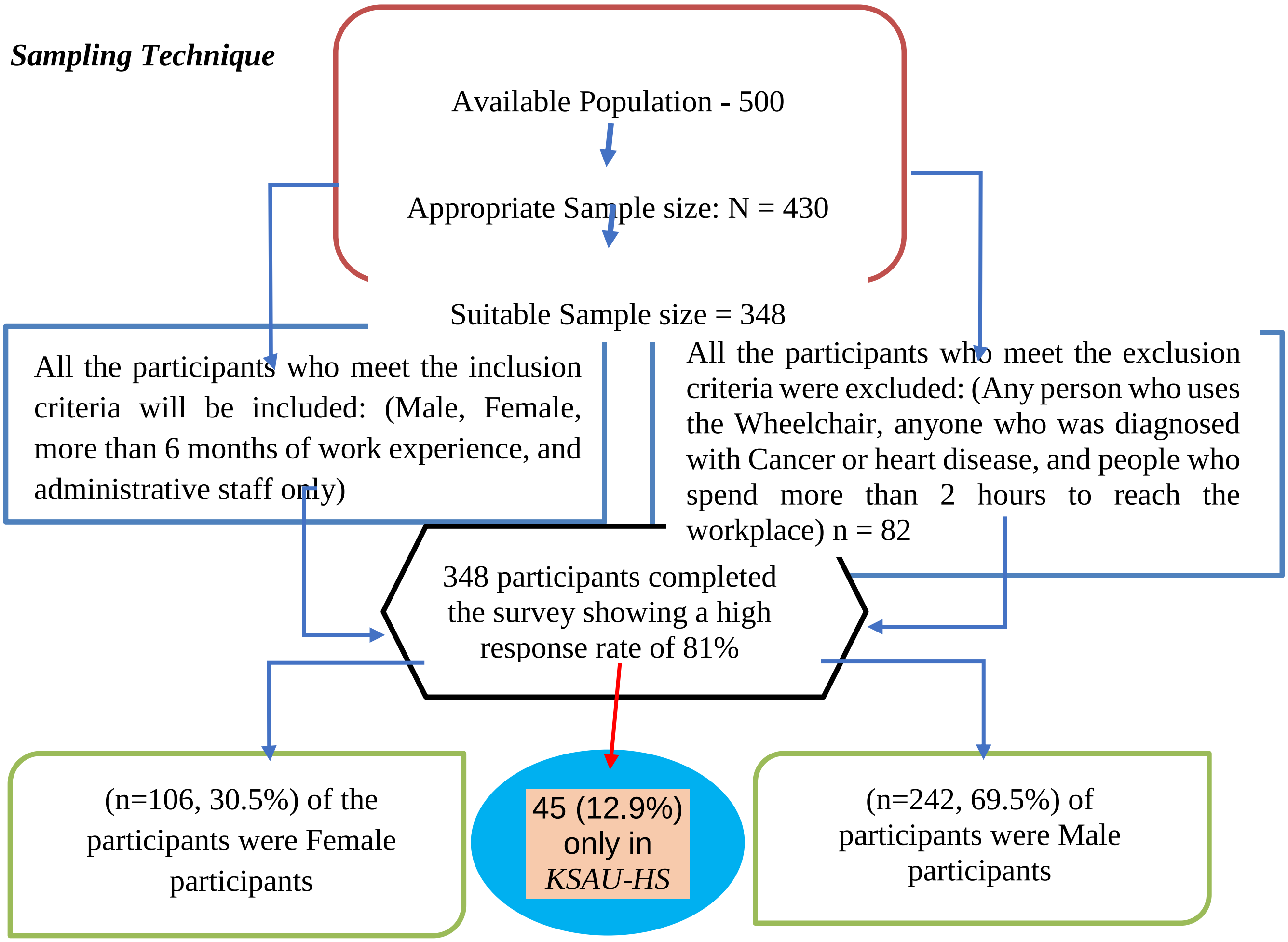
Sample Size

The healthcare professionals at KSAU-HS and AL-AHSA were the study's target audience. We evaluated the sample size using the *Roasoft calculator*. With a 95% confidence level and a 5% margin of error, it was expected that 50% of office workers were familiar with ergonomics. We requested an estimate of the number of office workers from KSAU-HS and AL-AHSA, and they provided us with 500. We calculated the projected sample size and discovered that it is 218 based on our estimated minimum population.

Random sampling technique, a form of non-probability sampling (convenience random Sampling), was utilized in the investigation.

participants who matched the requirements for inclusion were included. Within four weeks, the data collection was completed.

Sampling Technique



Data Collection methods

The survey evaluated the perceptions and knowledge of office workers regarding ergonomics and occupational therapy. An email with the survey link was sent to the KSAU-HS office staff member. The questionnaire has twenty-one questions covering four different domains, such as (i) awareness about chair adjustable, (ii) awareness about keyboard adjustable, (iii) awareness about mouse adjustable, and (iv) awareness about monitor adjustable.

Instrument content

10 items: General awareness about chair adjustable.

4 items: General awareness about keyboard adjustable.

3 items: Awareness about mouse adjustable.

4 items: Awareness about monitor adjustable.

Data Management and Analysis Plan

Using Microsoft Excel, the data were divided among the three groups after being collected and updated. The data was then exported to SPSS software for descriptive statistics analysis.

Ethical considerations

The researchers from King Saud bin Abdulaziz University for Health Sciences-Al Ahsa, informed the healthcare professionals about the study and its potential health benefits. IRB Approved(SP21A/255/06) by the (KAIMRC) King Abdullah International Medical Research Center, Kingdom of Saudi Arabia.

Results

The study included all participants who met the inclusion criteria. There were 430 participants in all, 348 of whom matched the requirements for inclusion and completed the survey, yielding an excellent response rate of 81%. Male participants made up (69.5%, n= 242) of the participants, While the proportion of female participants was the lowest (30.5%, n=106). the findings revealed that 12.9% of participants were working at KSAU-HS. The participants' age was described by descriptive statistics as (M= 36.26). Age up to 25 years (23.6%, n= 82), 26-35 years (29.9%, n= 104), 36-45 years (22.4%, n= 78), and 46-55 years (24.1%, n= 84) were represented. (Table *1*).

Table 1: Descriptive statistics on gender and age

	N (%)	**Age up to 25 Years N (%)**	**Age 26-35 Years N (%)**	**Age 36-45 Years N (%)**	**Age 46-55 Years N (%)**	**Age Mean ± SD**
Male	242 (69.5)	56 (23.1)	68 (28.1)	53 (21.9)	65 (26.9)	37.16 ±12.490
Female	133 (30.5)	26 (24.5)	36 (34)	25 (23.6)	19 (17.9)	34.23 ±10.578
Total	348 (100)	82 (23.6)	104 (29.9)	78 (22.4)	84 (24.1)	36.26 ±12.001

SD-Standard Deviation

Comparison between male and female

The percentages used to compare the questionnaire responses from male and female participants were close, as indicated in (Table *2*). There were 66% of women and 53.3% of men who could adjust the seat height to put their feet level on the floor. Both males (61.6%) and females (72.6%) were able to raise their knees to the same level as their hips. Males were more likely than females to be able to lie their legs comfortably under their work surface (73.1%) for men and 74.5% for women. Men are more likely (71.1%) than women to be able to set the keyboard so that their wrists are in a straight line with their arms. Men and women were equally likely to be able to lay the keyboards flat, at 55.4% and 67%, respectively. Their keyboard and monitor were placed in front of them, with male participants (85.5%) and female participants (82.1%). There are (79.8%) of men and (74.5%) of women who participated, with a suitable viewing distance (18-28 inches) from the monitor. The top third of their monitor screen was at eye level for participants who were male (72.3%) and female (62.3%).

Comparison between male and female

N of Q	Gender	Yes N (%)	No N (%)	Total N (%)	Chi-square test	P-Value
Q1	Male	129 (53.3%)	113 (46.7%)	242 (100%)	4.880	0.027^{*}
	Female	70 (66%)	36 (34%)	106 (100%)		
Q2	Male	149 (61.6%)	93 (38.4%)	242 (100%)	3.969	0.046^{*}
	Female	77 (72.6%)	29 (27.4%)	106 (100%)		
Q3	Male	133 (55%)	109 (45%)	242 (100%)	0.015	0.904^{ns}
	Female	59 (55.7%)	47 (44.3%)	106 (100%)		
Q4	Male	117 (48.3%)	125 (51.7%)	242 (100%)	0.133	0.715^{ns}
	Female	49 (46.2%)	57 (53.8%)	106 (100%)		
Q5	Male	158 (65.3%)	84 (34.7%)	242 (100%)	0.995	0.318^{ns}
	Female	75 (70.8%)	31 (29.2%)	106 (100%)		
Q6	Male	180 (74.4%)	62 (25.6%)	242 (100%)	4.467	0.035^{*}
	Female	67 (63.2%)	39 (36.8%)	106 (100%)		
Q7	Male	169 (69.8%)	73 (30.2%)	242 (100%)	0.766	0.381^{ns}
	Female	69 (65.1%)	37 (34.9%)	106 (100%)		
Q8	Male	173 (71.5%)	69 (28.5%)	242 (100%)	0.714	0.398^{ns}
	Female	71 (67%)	35 (33%)	106 (100%)		
Q9	Male	177 (73.1%)	65 (26.9%)	242 (100%)	0.073	0.787^{ns}
	Female	79 (74.5%)	27 (25.5%)	106 (100%)		
Q10	Male	170 (70.2%)	72 (29.8%)	242 (100%)	0.075	0.784^{ns}
	Female	76 (71.7%)	30 (28.3%)	106 (100%)		
Q11	Male	172 (71.1%)	70 (28.9%)	242 (100%)	1.651	0.199^{ns}
	Female	68 (64.2%)	38 (35.8%)	106 (100%)		
Q12	Male	157 (64.9%)	85 (35.1%)	242 (100%)	2.288	0.256^{ns}
	Female	62 (58.5%)	44 (34.1%)	106 (100%)		
Q13	Male	158 (65.3%)	84 (34.7%)	242 (100%)	1.374	0.241^{ns}
	Female	76 (71.7%)	30 (28.3%)	106 (100%)		
Q14	Male	134 (55.4%)	108 (44.6%)	242 (100%)	4.104	0.043^{*}
	Female	71 (67%)	35 (33%)	106 (100%)		

Q15	Male	208 (86%)	34 (14%)	242 (100%)	3.918	0.048*
	Female	82 (77.4%)	24 (22.6%)	106 (100%)		
Q16	Male	213 (88%)	29 (12%)	242 (100%)	2.188	0.139ns
	Female	87 (82.1%)	19 (17.9%)	106 (100%)		
Q17	Male	197 (81.4%)	45 (18.6%)	242 (100%)	0.004	0.952ns
	Female	86 (81.1%)	20 (18.9%)	106 (100%)		
Q18	Male	207 (85.5%)	35 (14.5%)	242 (100%)	0.674	0.412ns
	Female	87 (82.1%)	19 (17.9%)	106 (100%)		
Q19	Male	193 (79.8%)	49 (20.2%)	242 (100%)	1.178	0.278ns
	Female	79 (74.5%)	27 (25.5%)	106 (100%)		
Q20	Male	175 (72.3%)	67 (27.7%)	242 (100%)	3.496	0.062ns
	Female	66 (62.3%)	40 (37.7%)	106 (100%)		
Q21	Male	110 (45.5%)	132 (54.5%)	242 (100%)	0.037	0.837ns
	Female	47 (44.3%)	59 (55.7%)	142 (100%)		

ns- There is no Statistically significant difference between males and females at 95% (P > 0.05) in the Questions. *- There is a Statistically significant difference between males and females at 95% (P < 0.05) in the Questions.

Note: *Q3, yes mean parallel, no mean angled slightly down and Q14, yes mean flat, no mean slightly negative slope*

Office workers who employed in KSAU-HS

Males made up a somewhat greater percentage of the office workers working at KSAU-HS than did females, as seen in (Table *3*). There were both males (76.9%) and females (82.4%) who could adjust the seat height to put their feet level on the floor. There were 64.7% of women and 69.2% of men who could use the chair's lumbar support. There were 88.2% of women and 76.9% of men who could hold their forearms, wrists, and hands straight and in line. 64.1 percent of men and 70.6 percent of women had at least 1-2 inches between the outside of their thighs and the chair's edge. There were more men (79.5%) than women (64.7%), who could use armrests that were moved out of the way while typing but still helped during other activities. Men are more likely than women to be able to place the keyboard so that their wrists are in a straight line with their arms (74.4%) than women are (64.7%). The percentage of those who could lay the keyboard flat was 43.6% for men and 52.9% for women. Staff members who confirmed that the mouse was at the same level as the keyboard included (84.6%) of males and (76.5%) of women. The participants were seated right next to their keyboards, with (82.1%) of men and (82.4%) of women present.

Table 3: Office workers who employed in KSAU-HS

N of Q	Gender	Yes N (%)	No N (%)	Total N (%)	Chi-square test	P-Value
Q1	Male	30 (76.9%)	9 (23.1%)	39 (100%)	0.207	0.649^{ns}
	Female	14 (82.4%)	3 (17.6%)	17 (100%)		
Q2	Male	31 (79.5%)	8 (20.5%)	39 (100%)	0.064	0.800^{ns}
	Female	13 (76.5%)	4 (23.5%)	17 (100%)		
Q3	Male	25 (64.1%)	14 (35.9%)	39 (100%)	0.618	0.432^{ns}
	Female	9 (52.9%)	8 (47.1%)	17 (100%)		
Q4	Male	27 (69.6%)	12 (30.8%)	39 (100%)	0.111	0.739^{ns}
	Female	11 (64.7%)	6 (35.3%)	17 (100%)		
Q5	Male	30 (76.9%)	9 (23.1%)	39 (100%)	0.960	0.327^{ns}
	Female	15 (88.2%)	2 (11.8%)	17 (100%)		
Q6	Male	31 (79.5%)	8 (20.5%)	39 (100%)	2.578	0.108^{ns}
	Female	10 (58.8%)	7 (41.2%)	17 (100%)		
Q7	Male	27 (69.2%)	12 (30.8%)	39 (100%)	1.368	0.242^{ns}
	Female	9 (52.9%)	8 (47.1%)	17 (100%)		
Q8	Male	25 (64.1%)	14 (35.9%)	39 (100%)	0.222	0.637^{ns}
	Female	12 (70.6%)	5 (29.4%)	17 (100%)		
Q9	Male	33 (84.6%)	6 (15.4%)	39 (100%)	0.535	0.464^{ns}
	Female	13 (76.5%)	4 (23.5)	17 (100%)		
Q10	Male	31 (79.5%)	8 (20.5%)	39 (100%)	1.380	0.240^{ns}
	Female	11 (64.7%)	6 (35.3%)	17 (100%)		
Q11	Male	29 (74.4%)	10 (25.6%)	39 (100%)	0.541	0.462^{ns}
	Female	11 (64.7%)	6 (35.3%)	17 (100%)		
Q12	Male	31 (79.5%)	8 (20.5%)	39 (100%)	2.578	0.108^{ns}
	Female	10 (58.8%)	7 (41.2%)	17 (100%)		
Q13	Male	25 (64.1%)	14 (35.9%)	39 (100%)	0.830	0.362^{ns}
	Female	13 (76.5%)	4 (23.5%)	17 (100%)		
Q14	Male	17 (43.6%)	22 (56.4%)	39 (100%)	0.416	0.519^{ns}
	Female	9 (52.9%)	8 (47.1%)	17 (100%)		
Q15	Male	33 (84.6%)	6 (15.4%)	39 (100%)	0.535	0.464^{ns}
	Female	13 (76.5%)	4 (23.5%)	17 (100%)		
Q16	Male	32 (82.1%)	7 (17.9%)	39 (100%)	0.001	0.978^{ns}
	Female	14 (82.4%)	3 (17.6%)	17 (100%)		
Q17	Male	28 (71.8%)	11 (28.2%)	39 (100%)	0.281	0.596^{ns}
	Female	11 (64.7%)	6 (35.3%)	17 (100%)		
Q18	Male	29 (74.4%)	10 (25.6%)	39 (100%)	1.354	0.245^{ns}
	Female	15 (88.2%)	2 (11.8%)	17 (100%)		

Q19	Male	25 (64.1%)	14 (35.9%)	39 (100%)	3.379	0.066^{ns}
	Female	15 (88.2%)	2 (11.8%)	17 (100%)		
Q20	Male	24 (61.5%)	15 (38.5%)	39 (100%)	1.986	0.159^{ns}
	Female	7 (41.2%)	10 (58.8%)	17 (100%)		
Q21	Male	21 (53.8%)	18 (46.2%)	39 (100%)	0.760	0.383^{ns}
	Female	7 (41.2%)	10 (58.8%)	17 (100%)		

^{ns}- There is no Statistically significant difference between males and females at 95% ($P > 0.05$) in the Questions. *- There is a Statistically significant difference between males and females at 95% ($P < 0.05$) in the Questions.

Note: *Q3, yes mean parallel, no mean angled slightly down and Q14, yes mean flat, no mean slightly negative slope*

Discussion

The questionnaire is divided into four sections: ten questions about chair modifications, four questions about keyboard modifications, three questions about mouse modifications, and four questions about monitor modifications. Our study found the average percentage and awareness of chair modification for males (64.25%) and females (65.3%). The proportions are very close between males and females, and their awareness is moderate regarding the modification of the chair. However, there is still a low risk of musculoskeletal injuries. In terms of keyboard adjustment, the average percentage for men was 64.2% and 65.35 percent for women; similarly, the percentages for the two groups are roughly equal, and their awareness is average. Males and females both had high average percentages and awareness of mouse modification (85.13 and 80.2%, respectively). Males made up 71% of the average monitor ratio, while females made up 66%. Office personnel generally needs instruction and direction on how to sit for a long time comfortably, as well as clarification for managers that the products that can aid the staff's comfort are inexpensive. If they don't modify their workspace and adhere to the proper sitting posture, they will eventually get musculoskeletal pain. Despite having a high degree of knowledge and awareness of ergonomics, a substantial proportion of them did not obtain health education on ergonomics and a significant number are not implementing it. In this location, educational and empowerment programs are required [12]. Musculoskeletal issues are common among office employees, with lower back and shoulder discomfort being the most commonly reported regions of concern. Workers who were older, had more years of experience, were overweight, and had high-risk ergonomic ratings had a higher likelihood of musculoskeletal problems [13].

Conclusion

We concluded that KSAU-HS employees are more concerned about ergonomics. The results show that more aware of the appropriate screen distance and position, as well as performing some stretching exercises. Furthermore, studies revealed that the ratios of men and women were not significantly different, but rather similar. The role of occupational therapy is to establish more for office workers and to get help from therapists for preventative and intervention programs.

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