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An Assessment of Work-Related Disorder/Pain Among Computer Users in Nigeria

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Abstract: While using computer to solve problems and add value to live, unfortunately other health problems are incurred by user. The aim of this study is to evaluate these presuppose health problems developed while using computer. Many researches has shown that health injuries like: neck strain, eye strain, hand and wrist pain, low back pain and shoulder pain are triggered while using computer, as a result of long use without break or poor interaction between the computer and the user. To do this work, six computer workstation variables were selected to collect data with the help of questionnaire and checklist. Result gotten from respondents was use to plot statistical tables and analyzed. The study shows that most of computer users complained of work-related disorder because of poor computer workstations design, poor interaction between the user and the computer and long period use of computer without periodic.

Keywords: Anthropometry, Work-Related Disorder, Ergonomics, User, Disorder, Musculoskeletal

1. Introduction

As a result of rapid growth of information and communication technology in developing countries, with its application in almost every aspect of life, specifically in the area of: e-learning, e-payment, e-transact, e-government, e-banking e-library and e-registration [10]. Unfortunately while using computer to solve problem and create wealth, another health problem are created. Recent time more and more Nigerians are getting glue to their computer [11]. However, many of the users globally are now experiencing different health disorder or pain resulting from regular usage and poor interaction between the user and the computer [6, 9]. [4] Posited that regular use and improper positioning of arm induce injuries, [9], also reported that computer users in Nigeria University experience eye strain and neck pain. [5] Posited that constant use of computer without break causes vision-related disorder. [1] also posited that majority of computer workers experience some eye or vision symptom. All these injuries and pain sustained at computer workstations or workplace are called Work Related Disorder (WRD's). Some of these WRD's are neck strain, eye strain, hand and wrist tendinitis, low back pain, shoulder tendinitis and bursitis, carpal tunnel, tennis and golferelbow [3].

[16] Reported that an average of approximately one billion of US dollars is paid annually as insurance compensation claim to computer and other workers for WRD's injuries [16]. Nearly 600,000 workers are kept out of workplace as a result of computer related injuries [4].

From the above literature, it is evidently clear that there are computer work related disorder or pain which requires attention. Although, some of the reported studies lack uniformity even though some them were carried out in developed countries who formulated the anthropometric dimensions for assessing these parameters; and difference in work culture and office culture of users, genetic factor, nutritional intake, and adaptability in developing countries including Nigeria, hence this study is of necessity.

2. Methodology

2.1. Material

This study involves 120 participants (respondents). They were computer users who consistently uses computer system for a minimum of six months and above, and working with the computer for a period of 3hours and above per week as posited by [14]. The participants were situated at University of Benin, Benin City, Edo State and Obafemi Awolowo

University Ile-Ife, Osun State, both in Nigeria.

2.2. Instrument

Simple conventional tape was use to measure length and height, goniometer to measure angles and light meter to measure light rate.

3. Research Design and Sampling Techniques

An empirical approach will be employed in this research; a questionnaire [15], and checklist [12], as amended was use to collect data. The cluster sampling technique was used to randomly selected location and data collection. And computer workstations variables like: monitor viewing distance, monitor viewing angle, seat height, seat angle, keyboard height and lighting rate in collaboration with questionnaire and checklist. And these collected were plotted in statistical tables for analysis.

i. Monitor viewing distance: This was measured as distance from the floor to the edge of the monitor using the tape. Literature recommended height is between 19-40 cm [2].

ii. Monitor viewing angle: This was measured with goniometer. Literature recommended viewing angle are between 15°- 30° [2].

iii. Seat height: This was measured as distance from the floor to the tope seat surface using the tape. Literature recommended height is between 23-35cm [2].

iv. Seat back angle: This was measured as the angle between the horizontal and vertical bars of the seat using goniometer. Literature recommended angle is 90° [2].

v. Keyboard height: This was measured as distance from the floor to the keyboard tray using the tape. Literature recommended height is between 38 - 52cm [2].

vi. Lighting: This measured the light luminance rate using light meter. Literature recommend light rate of 1lux [2].

Table 1. Participants physical characteristic (n = 120).

S/N	Characteristic	Range	Mean (N)	Standard deviation (S)
1	age	22-61	42	8.2
2	Height	1.50-1.86	62.3	11.7
3	Weight	25-103	1.4	9.2

Table 2. Monitor viewing angle of participants.

S/N	Number. of participants	Mean viewing angle (degree)	Complaint of participants
1	36	15	Slight neck pain
2	21	20	No visibility of text on screen
3	19	25	No pain & change in visibility
4	26	30	No pain at least for 6hrs & there is visibility
5	18	35	No pain at least for 6hrs

Table 3. Monitor viewing distance of participant.

S/N	Numb. of participants	Min-Max range distance (cm)	Complaint of participants
1	28	31-39	Eye ache, heavy eyes
2	35	40-69	Slight eye ache
3	59	70-89	Eye strain

Table 4. Seat anthropometric measurement of participant.

S/N	Description	Mean	Standard deviation	Min-Max range (cm)
1	Height from floor to top of backrest	88.5	29.3	38-58
2	Height from floor to top to seat pan	43.8	2.1	23-35
3	Seat pan depth	41.0	14.2	1-4
4	Back rest width	44.1	43.8	35-47

Table 5. Computer work-related disorder of participants.

	Numb of participants		Eye strain		Neck pain		Hand & wrist pain		Low back/shoulder pain	
period	Nos	%	yes	no	yes	no	yes	no	yes	no
< 1hr	02	1.7	00	02	01	01	00	02	00	02
1-2 hrs	21	17.5	07	14	03	18	03	18	04	17
3-5 hrs	23	19.2	07	16	08	15	06	17	07	16
6-8 hrs	31	25.8	10	21	15	16	15	16	11	20
> hrs	43	35.8	26	17	21	22	22	21	19	24

Table 6. Showing location of disorder.

Location of disorder	Numb of participants	%
Eye	13	11.3
Neck	18	15.3
Low back	38	33.0
Wrist and arm	11	9.6
Arm and back	8	7.0
Back and eyes	15	13.1
Back and neck	12	10.4

Table 7. Showing rate of pain or severity.

S/N	Nature of pain	Numb of participants
1	Don't know	15
2	Mild	48
3	Severe	33
4	Very severe	10

4. Results

From Table 1, the mean age, height and weight were 42 ± 8.2, 62.3 ± 11.7, and 1.4 ± 9.2 respectively.

Table 5 show the various work-related disorder experienced by participants during computer work. The data shows that 41.7%, 40%, 38.3% and 34.2% of the participant experienced eye strain, neck pain, hand and wrist pain, and low back and shoulder pain.

Furthermore, a total of 41.8% representing user that uses computer for a period of 3 hours and above experienced work-related disorder, while only 3.7% experienced work-related disorder. And this clearly shows that work-related disorder increases with increase in the number of hours spent on computer uninterrupted [5].

The location of work-related disorder among 115 computer uses claimed to have work-related disorder as shown in Table 6 are: eye, neck, low back, wrist/arm, arm/back, back/eyes and back/neck. Table 6 also show that 33% of the participants complained of low back pain. The most work-related disorder locations complained about are low back, neck and eye pain in this order. And 5 participants representing 4.2% could not explain source of pain.

Similarly, Table 7 shows that 15 participant representing 12.5% cannot explain the severity of pain. 43participants representing 35.8% complained that their pains are severe or very severe, while 48 participants representing 40% complained of mild pain. A total of 75.8% complained of work-related disorder in all. This further reveals that usage of computer by users is highly correlated with work-related disorder [6, 9].

Table 4 show a deviation from normal for seat height from floor to top of backrest, height from floor to seat pan, seat pan depth and backrest width with deviation of ± 29.3, ± 2.1, ± 14.2 and ± 43.8 respectively. It therefore reveals that there is poor interaction between users and computer seat, and this poor interaction can induce work-related disorder as posited by [6, 17].

Table 2 shows that 36 participants uses computer with a mean viewing angle less than the recommended viewing angle of 19 - 40°, hence they complained of slight neck pain.

Table 3 reveals 94 participants representing 78.3% use wrong viewing distance posture. Their monitor viewing distance were a deviation of the recommended range of 19-40cm, hence they complained of eye strain and eye ache.

5. Conclusion

The findings of this study are that most of computer users complained of work-related disorder. This is as a result of poor computer workstations design [1], poor interaction between the user and the computer and long period use of computer without periodic breaks. This study hereby recommends thus:

i. Users, organizations and government should take proactive measures towards ergonomics best practice to avoid the health challenges.

ii. Users should take periodic break of 10 minutes for every hour spent on computer work [5], to avoid musculoskeletal and visual problem.

iii. Healthy interaction between the computer user and the computer and its peripheral devices should be encouraged.

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