Prevalence and Knowledge of Neck Pain among Information Technology Employees at New Assiut city

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Abstract:
Neck pain is a common health problem in the general population and especially among computer workers. **Aim:** To determine prevalence and knowledge of neck pain among information technology employees. **Subject and Methods:** Descriptive research design was used in this study. It was conducted in information technology company in smart village at New Assiut city by using convenience sample was used of all participants (118) employee. **Two** tools were used for data collection, **Tool** (I): A structured self-administered questionnaire which consisted of **four** parts: **1st** part included socio-demographic data, **2nd** and **3rd** part: assessment of employees' medical history and nature of the job, and **4th** part: assessment knowledge about neck pain, good posture, exercises. **Tool** (II): questionnaire to measure neck pain & functional disability. **Results**: The mean age of employees ±SD was 26.22 ± 2.85 (21.0-34.0), It was found that 85.6% of employees had poor knowledge, while 14.4% of them had fair knowledge regarding neck pain and exercises. **Conclusion:** More than two thirds of employees having neck pain. **Recommendation:** Implement health education program to information technology employees about neck pain and exercises.

Keywords: Information Technology employees, Knowledge, Neck pain &Prevalence.

Introduction

Neck pain (NP) is defined as the uncomfortable sensation in the neck region that extends from the occiput to the upper region of the back and laterally it goes to the upper and outer border of scapula. Neck pain is more prevalent in computer workers. Continuous work on computer results in excessive tension on muscles of body especially musculature of neck which causes pain in the neck region. **(Shah & Desai, 2021 &Khan& Faizan, 2016).**

There are seven cervical vertebras in the neck region. A vertebra has a body, pedicles, lamina, spinal process and transverse processes. These vertebras are placed on one another. Neck allows head to turn and flex in different directions. There is a prominence of thyroid cartilage in front of the neck in midline which is called Adam's apple. External and internal jugular veins are the main veins of neck region. Carotid arteries are the major arteries of the neck **(Gray & Vandyke, 2016).**

Neck pain is one of the most common musculoskeletal disorders worldwide, ranging from 42 to 67% in young adults and affecting 13% of adults at any one time and up to 30% males and 50% females in the course of a lifetime. Young adulthood is a sensitive period of life where development of musculoskeletal neck pain may be established and

impact future health **(Algarni, et al, 2017 & Almhdawi, et al, 2017).**

During computer work, when there is more flexion at neck then upper fibers of trapezius muscle have to do more work, this hyper activity of trapezius is associated with work related neck pain. The overall usage of computers is firmly related to expanded prevalence in neck and shoulder discomfort. The lifetime prevalence of neck pain is as high as 80%(**Lee et al., 2021).**

Community health nurse has important role in increase awareness about how to prevent neck pain as use good posture, take frequent breaks, adjust desk, chair and computer, avoid tucking the phone between your ear and shoulder when you talk. Use a headset or speakerphone instead**,** If you smoke, quit smoking because smoking can put you at higher risk of developing neck pain, avoid carrying heavy bags with straps over your shoulder and sleep in a good position. Head and neck should be aligned with your body. Use a small pillow under your neck. Try sleeping on your back with your thighs elevated on pillows, which will flatten your spinal muscles (**Chen, et al; 2018 &Cramer et al., 2018).**

Significance of the study:
Globally in 2017, the number of prevalent cases of neck pain was 288.7 million. The number of years lived with disability due to neck pain was 28.6 million. At regional level, the highest age standardized point prevalence of neck pain per 100000 populations in 2017 were in western Europe (4636.1), east Asia (4589.7), and North Africa and the Middle East (4458.4). The lowest age standardized rates per 100000 populations were in tropical Latin America (2505.6), eastern sub-Saharan Africa (2511.6), and Andean Latin America (2511.6) **(Saeid, et al; 2020).**

In Egypt, the study was conducted at Minia University; 182 employees at Minia University using computers in their office work including Information Technology (IT) section. The prevalence of musculoskeletal complaints was arranged in the following order lower back pain (78%), neck complaints (68.1%) and upper musculoskeletal complaints (61.5%) **(Elkhateeb, et al,2018).**

Aim of the study:
To determine prevalence and knowledge of neck pain among information technology employees at New Assiut city.

 Research question: -
1- What is the knowledge of IT employees about neck pain and exercises?
2-What is prevalence of neck pain among IT employees?

Subject and Methods
Research design:
Descriptive research design was used in this study
Setting of the study
The study was conducted in the IT company (Wasilla) in the smart village at New Assiut city. It was established in 2017. It offers to their employees' health and social insurance.
Sample:
The convenience sample was used in this study, all participants both male and female agreed to participate in this study, the sample size was (118) IT employees.
Tools of the study:
Tools of the study:
There are two tools were utilized to collect data for this study:
A tool I: A structured self-administered questionnaire developed by the researcher after reviewing researches and literature for the collection of data. It included four parts: -
Part I: It included socio-demographic data as age, gender, marital status, years of experience, educational status, place of receiving health services,

food habit, smoking habit, and economic status to assess social level **by using El-Gelany et al., (2012) scale**. It included 7 domains: Educational & cultural domain, (score=30), Occupation domain, (score=10), Family domain: (score =10), Family possessions domain (score of 12), Economic domain (score of 5), Home sanitation domain (score of 12) and Health care domain (score of 5).
Part II: It included assessment of IT employees' medical history as high blood pressure, diabetus, atherosclerosis, heart disease, osteoporosis, joint pain and problems in the vertebrae of the neck.
Part III: It included assessment of IT employees' nature of the job as working hours on the computer per day, overtime working hour per day, mode of transport, duration of use of the mobile phone use per day and duration of rest period.
 Part IV: It included assessment of IT employees' knowledge about neck pain, normal neck posture, isometric and stretching neck exercises as (definition, importance and steps of each exercise… etc).
Scoring system for knowledge, total score for knowledge item was (41) grade, a correct option was scored (1) grade and zero grade was given for the incorrect answer. Each item summed –up then converted into a percent score (poor =score < 50%, fair = score 50-70% and good = score > 70%**(Bazvand et al., 2020).**
Tool II: The Northwick Park Neck Pain Questionnaire (NPQ)
It was used to measures neck pain and the consequent functional disabilities. This questionnaire has been designed to give information about how neck pain has affected the ability to manage in everyday life. It contains nine items, 1- pain intensity, 2-neck pain during sleep, 3- numbness in arms at night, 4- duration of symptoms, 5- carrying, 6- reading and watching TV, 7- working/housework, etc, 8- social activities, and 9- driving (if applicable). **Total score NPQ** can be used to categorize pain: no neck pain (0-24%), mild (25-49%), moderate (50-74%), and severe (75-100%). **(Leak et al., 1994).**
Validity
The tools were transferred to the Arabic language and reviewed to ascertain their validity by five experts in the community and medical surgical nursing, who checked the method for clarity, relevance, comprehensiveness, understanding, and applicability.
Reliability
A reliability test was carried out by the researcher in order to examine the internal consistency of its questions. It was done during the pilot study before

starting of data collection. The value of Cronbach's alpha was = 0.827for knowledge and 0.857 for NPQ.

The study Phase

Administrative phase

An official approval letter was obtained from the dean of the Faculty of Nursing, Assiut University to the Silicon unit manager and then the director of information technology company employees in New Assiut city. The letters included permission to carry out the study.

Pilot study:

A pilot study was carried out before starting data collection on 10% (12 employees) in IT company; who were included in the sample due to there was no modification of sheet. It aimed to test the clarity of the tools and estimate the required time to fill the questionnaire.

Data collection phase (Fieldwork):

An explanation of the purpose of the research was done to Silicon unit manager, the director and then studied employees of IT company in New Assiut city to gain their cooperation before starting data collection. A self-administered questionnaire was filled out by IT employees after clarifying the instruction, the researcher started to collect data

from the mid of April 2021 to the end of May 2021 (6 weeks). Assessment was done on all the study sample 118 IT employee. The data was collected two days per week at evening time from 3 pm to 7 pm, average number of employees met per day 9-11. The length of each interview took from 20-25 minutes.

Ethical consideration

The ethical committee at the Faculty of Nursing has accepted the plan for study. there was no danger to the subject of the research during implementation of the study. IT employees were directed by their right to withdraw from research at any time. Confidentiality and anonymity was assured. The study was followed common ethical principal in clinical research.

Statistical Analysis

The Data obtained were reviewed, prepared for computer entry, coded, analyzed, and tabulated. Descriptive statistics as frequencies, percentages, mean and standard deviation were done using SPSS version 22. Chi-square was used to compare between qualitative variables. P-value considered statistically significant when less than 0.05 ($P < 0.05$).

Results

Table (1): Distribution of studied employees regarding socio-demographic data in smart village at New Assiut city,2021

Socio-demographic data	No. (118)	%
Age: (years)		
≤ 25	58	49.2
> 25	60	50.8
Mean ± SD 26.22 ± 2.85 (21.0-34.0)		
Gender:		
Male	64	54.2
Female	54	45.8
Marital status:		
Single	96	81.4
Married	22	18.6
Years of working experience:		
< 1 year	45	38.1
One year	25	21.2
Two year	24	20.3
Three year	12	10.2
Four year	4	3.4
> 4 years	8	6.8
Educational status:		
Graduate	105	89.0
Post-graduate	13	11.0
Place of receiving health service*		
Private clinics	69	58.5
Health insurance	38	32.2
Governmental hospital	36	30.5
Maternity and child care centers	4	3.4

Socio-demographic data	No. (118)	%
Food habit:		
Vegetarian	14	11.9
Animal	22	18.6
Vegetarian and animal	82	69.5
Smoking habit:		
Smoker	20	16.9
Non-smoker	98	83.1

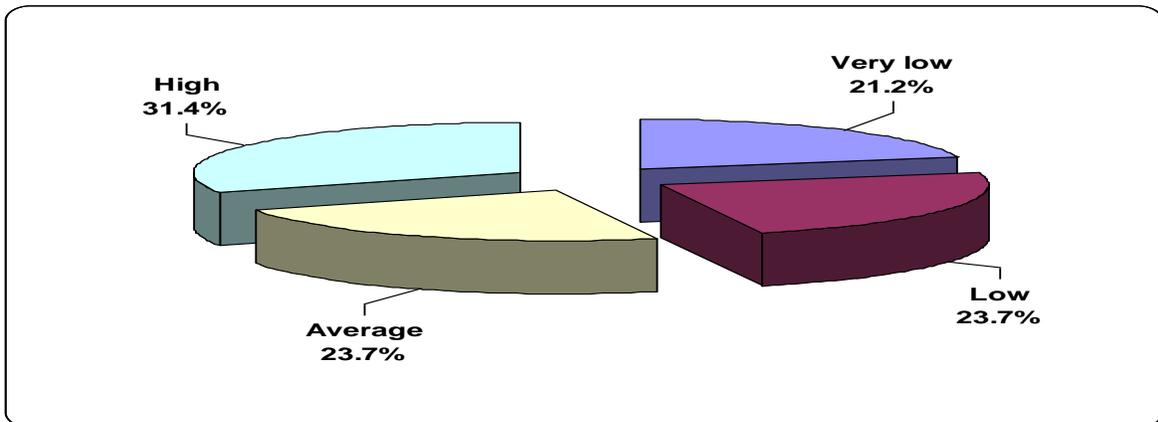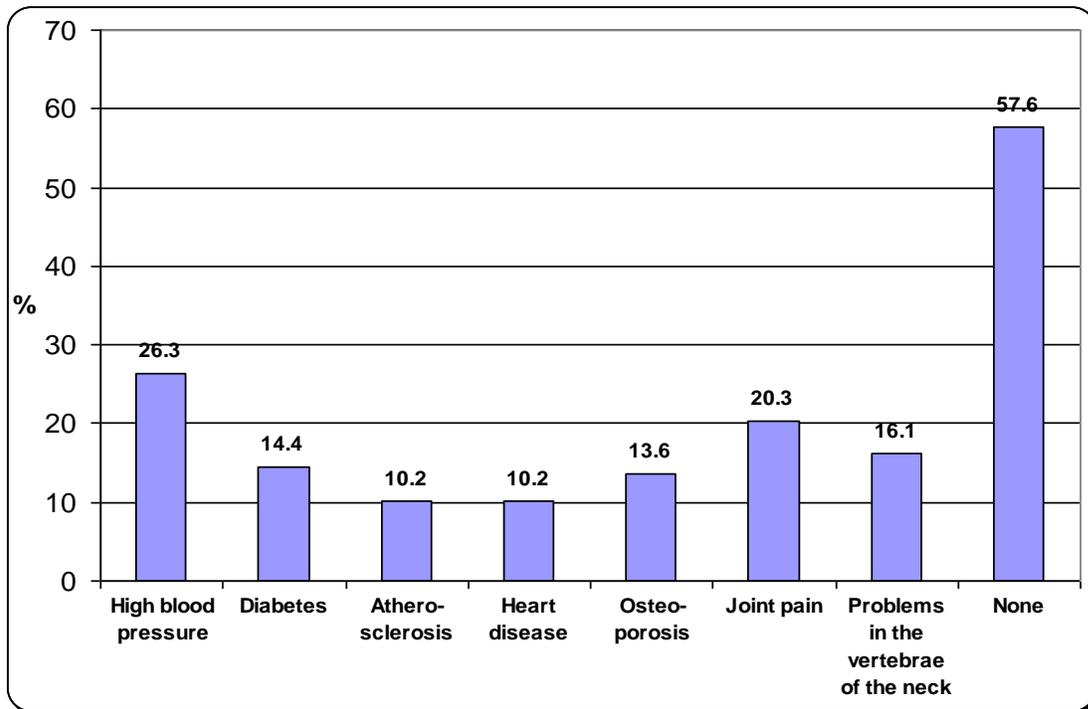** More than one answer was selected*

Figure (1): The Distribution of studied employees regarding social status in smart village at New Assiut city, 2021


* More than one answer was selected

Figure (2): The Distribution of studied employees regarding their medical history in smart village at New Assiut city, 2021

Table (2): Distribution of studied employees regarding nature of the job in smart village at New Assiut city, 2021

Item	No. (118)	%
Working hours on the computer per day:		
6 hours	11	9.3
8 hours	69	58.5
10 hours	38	32.2
Overtime working hours per day (out-side place of work):		
None	44	37.3
2 hours	41	34.7
4hours	23	19.5
6 hours	10	8.5
Duration of use of mobile phone:		
2 hours	26	22.0
4 hours	47	39.8
6 hours	24	20.3
8 hours	8	6.8
> 8 hours	13	11.0
Duration of rest period		
10 min	36	30.5
15 min	39	33.1
20 min	20	16.9
30 min	23	19.5
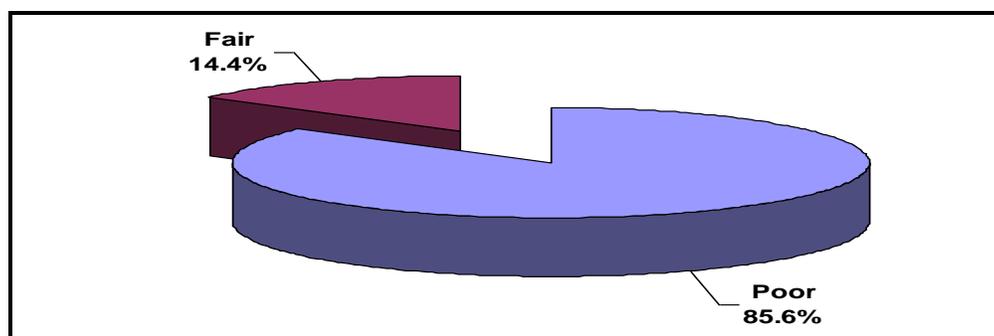
Figure (3): Total scores of knowledges regarding anatomy of neck, neck pain, exercises, and good posture among studied employees in smart village at New Assiut city,2021

Table (3): Distribution of the studied employees regarding complain from neck pain in smart village at New Assiut city, 2021

Item	No. (118)	%
Complain from neck pain:		
Yes	81	**68.6**
No	37	31.4
Duration of complain from neck pain (81):		
< 1 month	10	12.3
1 - < 3 months	20	24.7
3 - < 6 months	28	**34.6**
≥ 6 months	23	28.4
Symptoms of neck pain that you complain from* (81):		
Numbness and tingling in the neck	57	**70.4**
Sharp pain when severely touched	35	43.2
Difficulty moving	15	18.5
Tingling or pinching in the arm	58	**71.6**
Headache and facial pain	23	28.4
Dizziness and lightheadedness	17	20.9
Shoulder pain	66	**81.5**

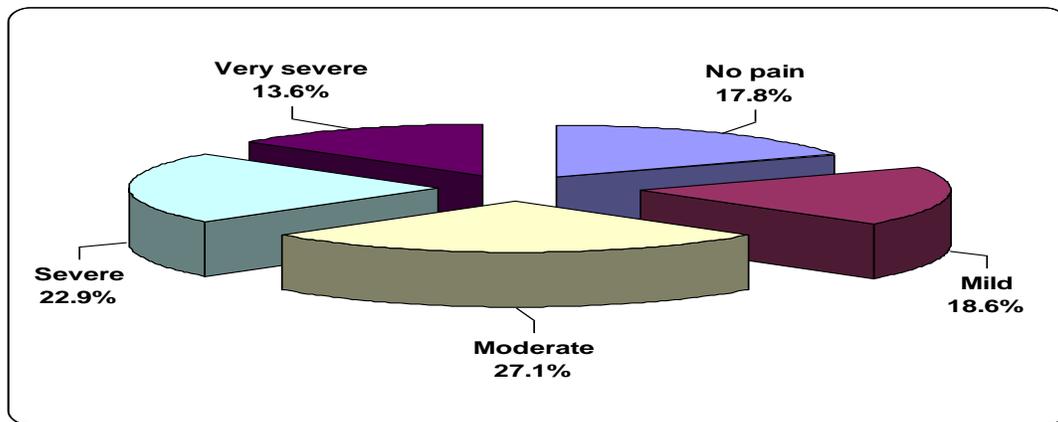* **More than one answer was selected**

Figure (4): Distribution regarding intensity of neck pain among studied employees in smart village at New Assiut city,2021
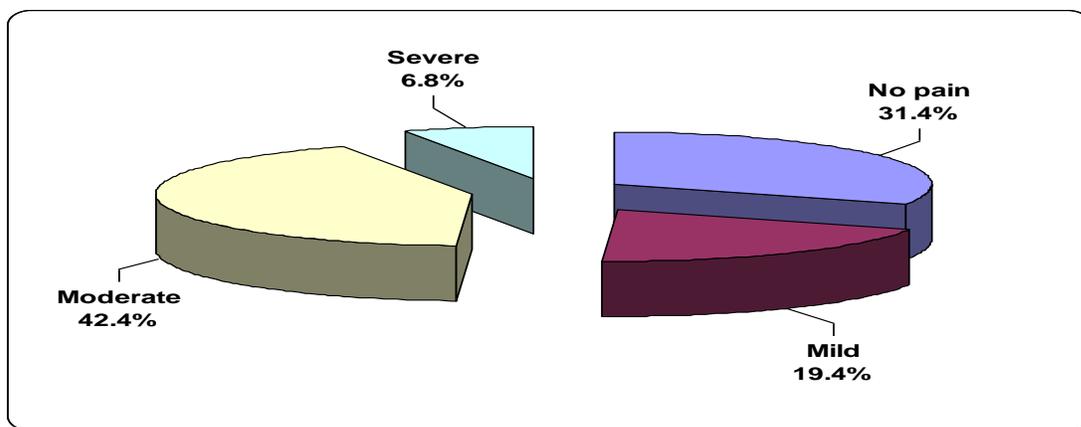

Figure (5): Prevalence of neck pain & functional disability among studied employees in smart village at New Assiut city,2021

Table (4): Relation between knowledge score, neck pain and a functional disability score with their socio-demographic data among studied employees in smart village at New Assiut city, 2021

Socio-demographic data	Knowledge score	Neck pain & a functional disability score
	Mean ± SD	Mean ± SD
Age: (years)		
≤ 25	15.41 ± 5.89	15.81 ± 4.40
> 25	12.29 ± 4.95	16.56 ± 4.32
p-value	**0.017***	0.469
Gender:		
Male	15.69 ± 6.59	14.77 ± 4.68
Female	11.79 ± 3.57	17.58 ± 3.57
p-value	**0.002***	**0.005***
Marital status:		
Single	14.02 ± 5.85	15.95 ± 4.44
Married	12.00 ± 3.72	17.54 ± 3.78
p-value	0.238	0.235
Years of experience:		
< 1 year	15.45 ± 6.62	15.68 ± 4.88
One year	14.52 ± 4.39	15.57 ± 4.18
Two years	11.24 ± 3.53	18.76 ± 2.31
Three years or more	12.38 ± 6.54	14.92 ± 4.80
p-value	0.078	**0.047***

Socio-demographic data	Knowledge score	Neck pain & a functional disability score
	Mean ± SD	Mean ± SD
Educational status:		
Graduate	13.97 ± 5.39	16.48 ± 4.43
Post-graduate	11.91 ± 6.46	14.82 ± 3.71
p-value	0.261	0.244
Social status:		
Very low	13.33 ± 4.37	17.44 ± 4.02
Low	11.89 ± 3.35	17.84 ± 3.82
Average	15.00 ± 5.82	14.19 ± 5.00
High	14.55 ± 7.56	15.25 ± 3.88
p-value	0.337	**0.032***

* Statistical significance difference at p<0.05   *Chi-square was used*

Table (5): Relation between total knowledge scores of studied employees and complain from neck pain in smart village at New Assiut city, 2021

Complain from neck pain	Total knowledge scores				P-value
	Poor		Fair		
	No.	%	No.	%	
Symptoms of neck pain that you complain from:**					
Numbness and tingling in the neck	51	64.6	6	50.0	0.353
Sharp pain when severely touched	32	40.5	3	25.0	0.359
Difficulty moving	12	15.2	3	25.0	0.410
Tingling or pinching in the arm	55	69.6	3	25.0	**0.007***
Headache and facial pain	18	22.8	5	41.7	0.171
Dizziness and lightheadedness	16	20.3	1	8.3	0.452
Shoulder pain	59	74.7	7	58.3	0.299

*** More than one answer was selected*   *Chi-square was used*
* Statistical significance difference at p<0.05,

Table (6): Relation between Level of neck pain & functional disability of studied employees and complain from neck pain in smart village at New Assuit city

Complain from neck pain	Level of neck pain and functional disability(118)								P-value
	No pain 37		Mild 23		Moderate 50		Severe 8		
	No.	%	No.	%	No.	%	No.	%	
	Symptoms of neck pain that you complain from:**								
Numbness and tingling in the neck	3	27.3	10	45.5	43	86.0	1	12.5	0.000*
Sharp pain when severely touched	1	9.1	6	27.3	26	52.0	2	25.0	0.022*
Difficulty moving	0	0.0	3	13.6	10	20.0	2	25.0	0.366
Tingling or pinching in the arm	4	36.4	5	22.7	46	92.0	3	37.5	0.000*
Headache and facial pain	1	9.1	8	36.4	13	26.0	1	12.5	0.300
Dizziness and lightheadedness	1	9.1	4	18.2	11	22.0	1	12.5	0.745
Shoulder pain	8	72.7	14	63.6	42	84.0	2	25.0	0.004*

** More than one answer was selected   *Chi-square was used*
* Statistical significance difference at p<0.05
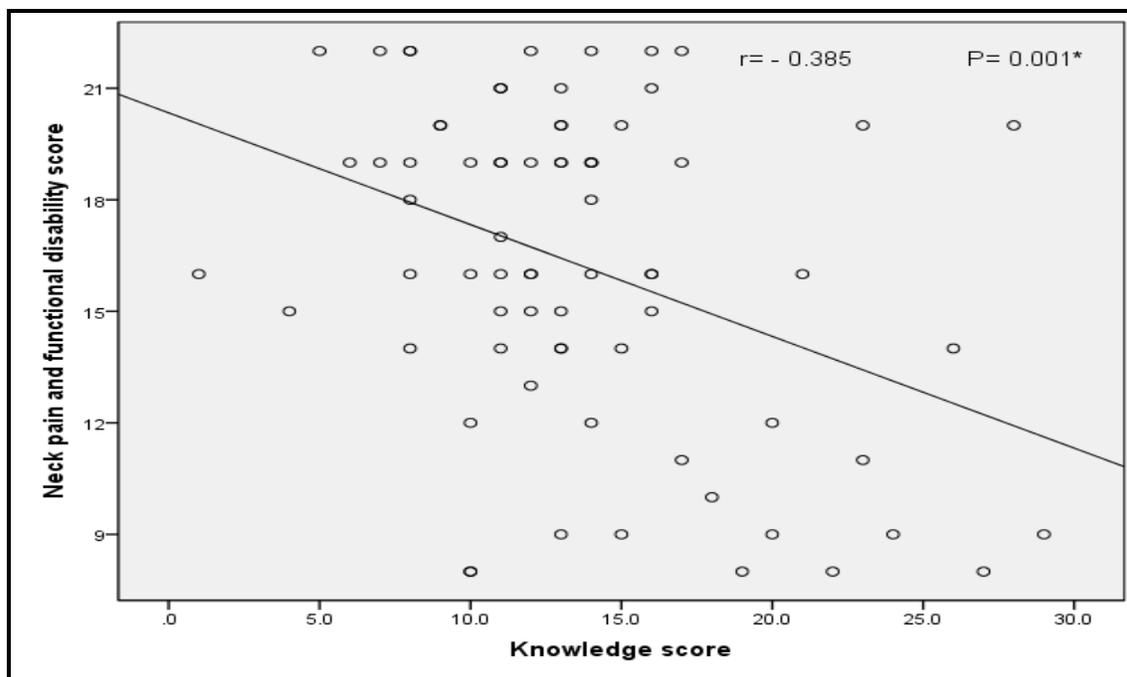
Fig. (6): Correlation of total knowledge scores with Neck pain and functional disability among studied employees in smart village at New Assiut city,2021.

Table (1): Shows that the age group > 25 years represents 50.8%with mean age 26.22 ± 2.85 (21.0-34.0), 54.2% and 38.1% of studied employees were male and had <1-year experience, also 83.1% of them were a non-smoker.

Figure (1): Mentions that 31.4% of studied employees were high class while 21.2% of them were very low.

Figure (2): Shows that there was 26.3% of them had high blood pressure while 57.6% of them didn't have any diseases **.**

Table (2): Reveals that 58.5% of the studied employees worked on computer 8 hours per day, 34.7% of them have overtimes outside place of work 2 hours per day.

Figure (3): Found that 85.6% of participants had poor knowledge regarding neck pain, exercises, and good posture.

Table (3): Illustrate that 68.6 % of studied employees complain from neck pain and noticed that 34.6% of them were 3-<6 months. Also, found that 70.4%,71.6% and 81.5 % of partacipants respectively have numbness and tingling in the neck, tingling or pinching in the arm and shoulder pain.

Figure (4): Represents that 18.6% of studied employees had mild pain, 27.1% had moderate pain, 22.9 % had severe pain and 13.6 % of them had very severe while 17.8% of them had no pain

Figure (5) Shows the prevalence of neck pain & functional disability was 68.6 % of studied employees while 31.4% of them had no pain.

Table (4): Illustrates that there was a significant statistical difference between knowledge of studied employees with their age, gender (p=0.017, 0.002 respectively). Also, showed that there was a significant statistical difference between neck pain &functional disability score and gender, years of working experience and social status (p=0.005, 0.047 and 0.032 respectively).

Table (5): Represents that there was a significant statistical difference between total knowledge scores of studied employees with symptoms of neck pain as tingling or pinching in the arm at (p=0.007).

Table (6): Found that there was a significant statistical difference between level of neck pain and functional disability of studied employees with Symptoms of neck pain as numbness and tingling in the neck, sharp pain when severely touched, tingling or pinching in the arm and shoulder pain at (p =0.000, 0.022, 0.000 and 0.004 respectively).

Figure (6): Shows that negative correlation between knowledge scores of neck pain, exercises & good posture **with** the level of neck pain &functional disability.

Discussion:

Neck pain is a common health problem in the general population and especially among computer workers. It is also increasing in intensity, frequency, and severity because of more stress and strain on the upper back and neck region   **(Khan & Faizan,(2016).**

The present study aimed to assess knowledge and determine prevalence of neck pain among information technology employees at Assiut city.

The present study shows that the mean age group of information technology (IT) employees' were 26.22 ± 2.85, it was ranged from 21:34, these results consistent with **Bhalala,(2019)** who conducted a study about the prevalence of neck Pain in computer workers in Surat city and they reported that the age of computer workers ranged from 20: 30 years.

Concerning to gender of the studied IT employees, the current study showed that more than half of the studied IT employees were male while more than two-fifth of them were female. These results are in the same line with **Markopoulos et al., (2020)** who conducted a study on motivating neck exercises in computer workers in Neckio and they mentioned that more than half of them were male, while more than two-fifth of them were female. Because may be due to the site of the information technology company was far and they take night shift in the company.

Regarding years of working experience, it was noticed that more than one third of them had <1 years, this finding agreed with **Mohan et al., (2021)** who conducted a study prevalence of complaints of arm, neck, and shoulders among computer professionals in Bangalore, they displayed that about more than one third of them had 1-3 years. This attributed that continuous work on computer results in excessive tension on muscles of body especially musculature of neck which causes pain in the neck region

Concerning educational status, the current study shows that about majority of the studied IT employees were graduates, these results disagreed with **Chakraborty et al., (2020)** who carried out a study about work-related neck pain among bank employees in Kolkata, India found about two-thirds of employees were graduates. This attributed to IT company selects high qualifications, graduates only.

The current study indicated that more than three-quarters of the studied IT employees were non-smokers. These results agreed with **Borhany et al., (2018)** who study musculoskeletal problems infrequent computer and internet users, reported that seventeen percent of workers were a smoker. This may be due to increased awareness about risks of smoking and increased taxes on buying.

Related to medical history about chronic disease, the current finding revealed that more than one-quarter of IT employees had complained of high blood pressure. The current finding concurs with **Chakraborty et al., (2020)** who mentioned that more than one-quarter of employees had hypertension. This may be due to working on computer lead to increase stress. It is high risk for hypertension.

According to working hours on the computer per day, the present study shows that half of the studied IT employees worked 8 hours. The present study results agree with **Khan & Faizan, (2016)** who conducted a study about neck pain in computer users, they mentioned that half of the computer users worked 8-9 hours. This may be attributed to the worker may not actually work for more than eight hours a day or forty-eight hours a week, and the periods designated for eating and rest are not included according labor law. when increase working hours on the computer per day, increase risk for neck pain so encourage the company's officials to take care of the rest periods for employees and encourage them to practice neck exercises to prevent pain.

The current result shows duration of rest period that about one-fifth of the studied IT employees taken break thirty minutes. The present study results disagree with **Chakraborty et al., (2020)** who revealed that more than one-third of employees had a break < 1 hour. This may be attributed to one of the strategies to prevent neck pain is the active use of breaks at work (especially micro breaks) (**Malińska et al., 2021**).

Regarding the prevalence of neck pain & functional disability, the present study cleared that more than two-thirds of studied IT employees had neck pain & functional disability. These results agreement with **Younis et al., (2017), Motamedzadeh et al., (2021)** who conducted a study on ergonomic risk factors and musculoskeletal disorders in bank staff, in Iran who found that more than two-thirds of them had neck pain. This may be attributed to spending too much time in a static posture and daily use of the computer. The study findings disagreement with **Khan & Faizan, (2016)** who reported that more than one quarter had neck pain.

The current study results showed that more than two third of studied employees complain from neck pain. These results disagree with **Darivemula et al (2016)** who conducted study about work-related neck pain among desk job workers of tertiary care hospital in New Delhi, India, reported more than one quarter of the desk job workers suffered from work-related neck pain over the period of one year in this study.

According to the duration of complain from neck pain, these present results revealed about one-quarter

of them complained neck pain from 1- < 3 months. The study findings were disagree by **Chakraborty et al., (2020)** who mentioned that more than one quarter complained neck pain from one month – to 3 months.

Also, this study observed that more than two third of studied employees had numbness and tingling in the neck, arm. These results were opposed with **Mullai, (2016)** who conducted a study about the effectiveness of isometric exercise on neck pain and functional disability among computer professionals at selected IT companies, found that more than two-fifth of computer operators had tingling and pricking.

Also, these present results revealed that majority of them complained from shoulder pain and disagree with **Borhany et al., (2018)** who showed that more than two-fifth of computer and intent users suffered from shoulder pain. This may be caused by excessive pressure on the nerves in this area of the body, causing weakness in the muscles in the arms and hands, numbness and pain in the shoulders.

Related to their knowledge about isometric & stretching neck exercises, the current results revealed that about three quarters of IT employees had poor knowledge about isometric neck exercise and more than three quarters had poor knowledge about stretching neck exercises, it may be due to lack of seminars, conferences, and courses about isometric & stretching neck exercises in an information technology company, This result disagrees with **Markopoulos et al., (2020)** who revealed that the majority of them knew that exercise can reduce neck pain.

According to Pain intensity, the present study mentioned that less than one fifth had no pain, more than one quarter had moderate pain, less than one quarter had severe pain and more than one over eight had very severe of studied IT employees. In contrast with this study conducted by **Bhalala, (2019)** reported that more than half had no pain, more than one over eight had moderate pain, eight percent had severe pain and one percent had very severe pain.

In addition, the current study demonstrated that more than three-quarters of studied employees had poor knowledge regarding neck, neck pain, isometric & stretching exercises, and good posture. Also, more than one over eight of them had fair knowledge, which may be due the lack of advertising campaigns through mass media about neck pain, neck exercises, and the feasibility of obtaining painkillers, so feasibility leads to a lack of awareness& interest for searching about knowledge about neck pain, neck exercises & good posture.

Conclusion

Based on the results the study, it can be concluded that: Majority of employees had poor

knowledge and more than two thirds of having neck pain.

Recommendations:

Based on the results of the present study, the following recommendations are suggested:

- Improve IT employees' awareness about neck pain by seminars, workshops.
- Implement educational program and provide counseling about good posture, neck exercises for all employees.
- Educational program can be conducted on a larger sample to generalize the findings.
- Check follow up for all employees in the IT companies periodically for early detection muscle skeletal disorders.
- Further research about complication from staying for long hours to prevent muscle skeletal disorders.

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