International Journal for Multidisciplinary Research (IJFMR)
E-ISSN: 2582-2160 ● Website: www.ijfmr.com ● Email: editor@ijfmr.com

Analysis Of Working Posture Using Kinovea Software to Identify the Incidence of Forward Head Among Bank Employees: A Cross-Sectional Study

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Abstract:

Background: Navi Mumbai is the most developed city in india and hence home for many banks.

Purpose: The analysis was done to identify the Craniovertebral angle and their effects.

Method: Hundred bankers who had spent at least one-year on the job participated in this survey. They were recruited by non-probability sample of convenience from various banks situated in Navi mumbai.

Results: Craniovertebral angle of 100 bank employees was measured. Forward head posture is identified by measuring Craniovertebral angle. Measurement of Craniovertebral angle is from C7 spinous process to tragus of ear. Forward head posture is common in all age groups, mean age group in males is 22-44 years and normal Craniovertebral angle in them is about 48.8 degrees. Mean age group in females is 23-55years and normal Craniovertebral angle in them is about 47.6 degrees. Normal Craniovertebral angle is 49.9 degrees.

Keywords: Kinovea software, Digital camera, banking sector, work related musculoskeletal disorder.

Introduction:

Employees of Bank industries are subjected to various physical demands, prolonged sitting and standing postures which may lead to neck pain. Professional banking users using paper and pencil, with rapid advancement in technology, especially data by displaying information at the Visual Discomfort Terminal, workers and environment affected the work. In the banking sector, bankers' works involve the use of computer for data collection, processing and programming, hence they are exposed to risk factors for the development of musculoskeletal disorders inherent in the computing industries. (1)

Bankers using paper and pencil with the rapid advancements in technology, especially in the use of electronic data by displaying information at the Visual Discomfort Terminal (VDT) , workers and the environment affected the work.(2)

Common complaints among computer operator include discomfort, aches and pains in the neck and shoulder, but also eyestrain. The sheer number of such complaints indicates that the proper positioning of the monitor has not received enough recognition as an important factor in the arrangement of a computer workstation and then results in FHP.(3)

KINOVEA software requires capturing photographs in a standardized manner. Then, photographs are digitalized for further analysis using computer software. (KINOVEA SOFTWARE)(5)

Kinovea computer program is software that is able to measure ROM of the joints of the body; the overview function is a summary image of the video. It samples images from the video at regular interval and creates a composite picture where you can see the motion at a glance. The reverse function lets you play the motion back ward. Goiometers and inclinometers were used to measure cervical ROM. The CROM is one of the most used and recent tools among clinicians which has a good validity and reliability. However, it is a relatively expensive instrument.(6)

Musculoskeletal disorders are one of the common occupational disorder, so there are many bankers in the world facing physical and emotional problems.(2) work conditions are also often plays an important role in working postures which includes static and bent posture. It affects the quality of life and losing time for work.(6)

Review of literature:

1) A study "Prevalence and Patterns of Work-related Musculoskeletal Disorders among Bankers" by Stanley M maduagwa Rebecca DW Maijindadi, Kunaba I Duniya, Adetoyoje Y. Oyeyemi , Ismaila A. Saidu, and Bukola J Aremu Stanley (June 2014) indicates that, Two hundred and twenty six questionnaires were duly completed. Most participants were males (76.55%). Their ages ranged from 20-48 years (mean=31.54 ± 8.71). One hundred and sixty two (71.68%) of the respondents reported WMSDs in at least one region of the body in the previous 12 months. Conclusion: The study revealed that significant percentage (71.68%) of the bankers reported WMSDs in at least one region of the body in the previous one year.

2) A study "Evaluation the posture of bank employees by using two methods RULA and REBA" Babak fazli, Zahra sharif poor, Marzieh Noorani , Amir hooshang Mehrparvar, Sayed Mohammad Jafari (July 2015) indicates that the results obtained from comparison of the two evaluation methods in present study also indicate that there is no linear correlation between the results of two methods ($p > 0.05$) . In addition the results of reliability analysis with alpha=0.005 for complete results of two methods indicate that there is no consistency between two methods.

3) A study "Neck Pain in Adults with Forward Head Posture: Effects of Craniovertebral Angle and Cervical Range of Motion" Dae-Hyun Kim a, Chang-Ju Kim b,*, Sung-Min Son b, (October 2018), indicates that the FHP in the pain group showed a significant difference in the CVA and the cervical ROM

in both flexion and extension, compared with those in the FHP without pain group (p less that 0.05). Logistic regression analysis indicates that the occurrence of cervical area pain was heigher amongst subjective who had a decreased CVA and flexion motion.

4) A study "A Study on Work Related Neck Pain among Bank Employees in Kolkata, India" Sourav Chakraborty, Debasish Sinha, Sita Chatterjee , Mausumi Basu, Raghunath Misra (June 2020) indicates that About 47.41% suffered from WRNP.Significant association were found between WRNP and higher age, education below graduation, duration of employment, bad posture, environment, mental stress, job pressure) and ergonomics of work station, height of monitor screen, distance from mouse to edge of table etc.

5) A study “Photogrammetric Quantification of Forward head posture is side dependent in healthy participants and patients with mechanical neck pain".Aliaa Rehen Youssef (June 2016) indicates that, In healthy adults the CVA was not significantly different across sides ($p>0.05$) whereas the gaze angle was different regardless of the testing position ($p <0.05$). For patients with mechanical neck pain, CVA differed in standing ($p <0.05$) but not in sitting position ($p >0.05$), whereas the gaze angle did not differ regardless of the testing position ($p >0.05$).

6) A study "Work-Related Musculoskeletal Disorders Among Computer Users" N Yasmin1, MFA Bhuiyan2, S Lahiry1 (October 2008) indicates that Different ergonomical factors are responsible for the development of different musculoskeletal problems. In this study, 24 positions were assessed. More than two fifths of the respondents maintained correct position ranging 10 to 14 followed by one fifths ranging from 15 to 25. The proportion of people with MSDs increased with use of computers in incorrect positions. Palmer et al. (2001) studied the relationship between upper limb symptoms and keyboards users. They concluded that the use of keyboards was associated with discomfort at the shoulder and wrist or hand.

7) A Study “Prevalence of work related musculoskeletal disorders and associated factors among bank staff” Guluma Etana1, Mengistu Ayele2, Daba Abdissa3, Asfaw Gerbi4 (JULY 2021) indicates that work related musculoskeletal disorders among bank staff are high. In this study 335 participants were involved ,the most affected body parts in bank staff were low back and neck. The factors were affected in the staff was awkward posture and job stress.

8) A study “Work related musculoskeletal disorders of upper limb” Michel Aptel1, Agnes Aublet-Cuvelier2 (December 2002) indicates that msk disorders for which some conditions are consider as major risk factors. Although the participants has complaints with MSDs in UL are more. In this study there were two-thirds of occupational disorders recognized in participants.

Methodology:

The participants for this study were 100 bankers who had spent at least one-year on the job. They were recruited from the various banks situated in Navi Mumbai.. Staff of banks that are no bankers were excluded from the study. The excluded non bankers were the auxiliary staff which included messengers, cleaners, janitors, and security men and women. Bankers in other hand are those technical and skilled staff that are involved in the use of computer or other means for data collection, processing and programming of day to day financial and business transactions in the banking sector. Before executing this study, ethical

approval was sought and obtained from the principal author's institution's Research and Ethical Committee.Cover letters explaining the purpose of the study as well as assurance that the information obtained will be used strictly for research purposes were distributed to all the managers of the banks where the participants were recruited. Every participant was also requested to sign a consent form prior to the study. The objective, procedure of filling the questionnaire and benefits of the study were explained to the participants, and they were assured that the study has no known inherent physical harm.

Then the data collection sheet was collected from all the bankers. And the photographs has been taken from digital camera in sideline view, then the data was processed into the laptop and Craniovertebral angle (CV) was measured in Kinovea software. Then all the data was transferred into the table using the excel sheet, and result was obtained. The effect of Craniovertebral angle was obtained by measuring the intensity of pain, and majority of the bank employees found that they are having neck pain which was due to bent neck.

Analysis and interpretation:

Analysis and interpretation were done with help of final results.

TABLE 1. DISCRIPTIVE OF BASELINE PARAMETERS

VARIABLE	MEAN	STANDARD DEVIATION
AGE	35.48	10.10
BMI (KG/CM)	23.06	5.473
YEARS OF EXPERIENCE	12.33	8.82
HOURS OF WORKING	8.02	0.14
CRANIOVERTEBRAL ANGLE (CV)	41%	0.0668

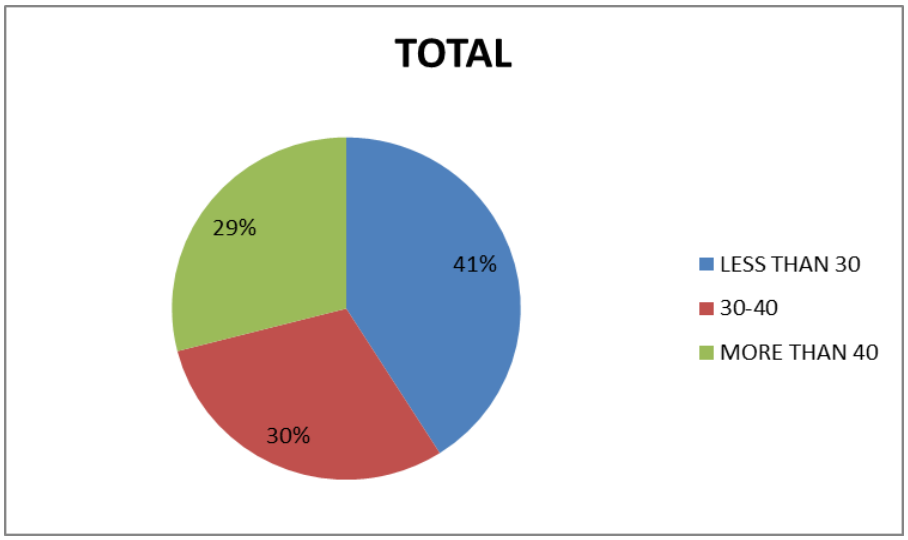
Table no.2 CV ANGLE OF BANK EMPLOYEES.

AGE GROUP	FORWARD HEAD	NORMAL
AGE 25-35	47	13
AGE36-45	19	2
AGE 46-55	17	2

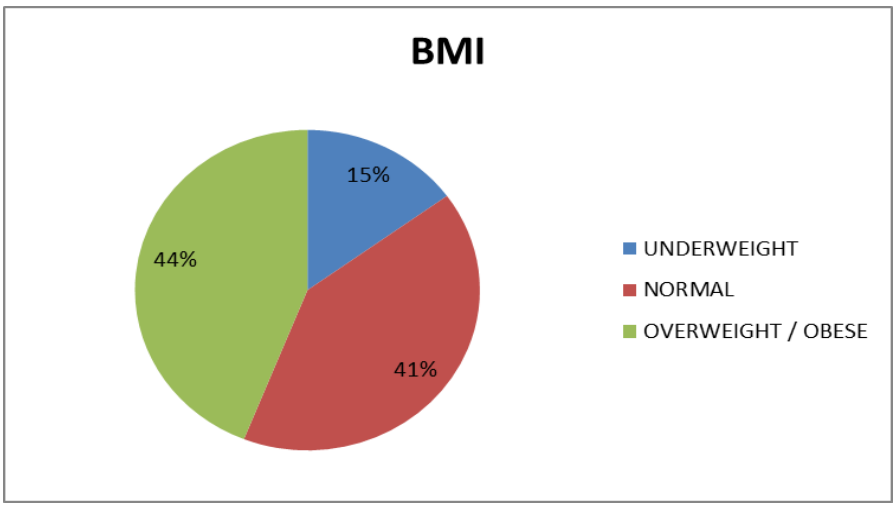
Table No.3 Effect of CV Angle on pain region according to VAS scale.

INTENSITY OF PAIN	1	2	3	4
NECK	13	14	12	0
BACK	5	14	9	0
SHOULDER	0	0	0	0
WRIST	9	1	1	0
ELBOW	4	4	0	0
KNEE	0	4	6	4

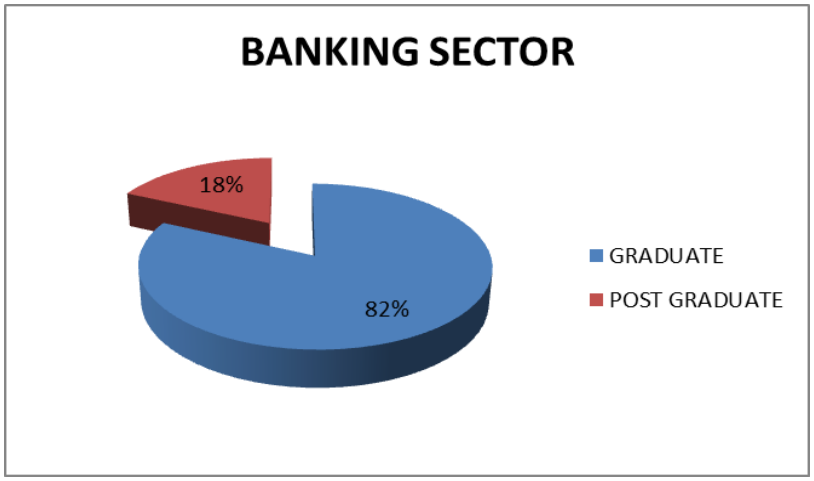
GRAPH 1- MEAN PERCENTILE OF AGE OF BANK EMPLOYEES (N=100)



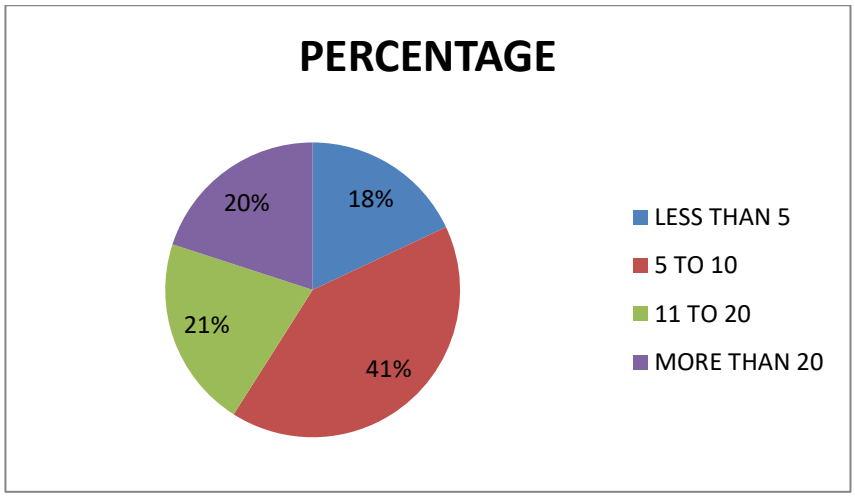
GRAPH2-MEAN PERCENTILE BMI OF BANK EMPLOYEES N=100



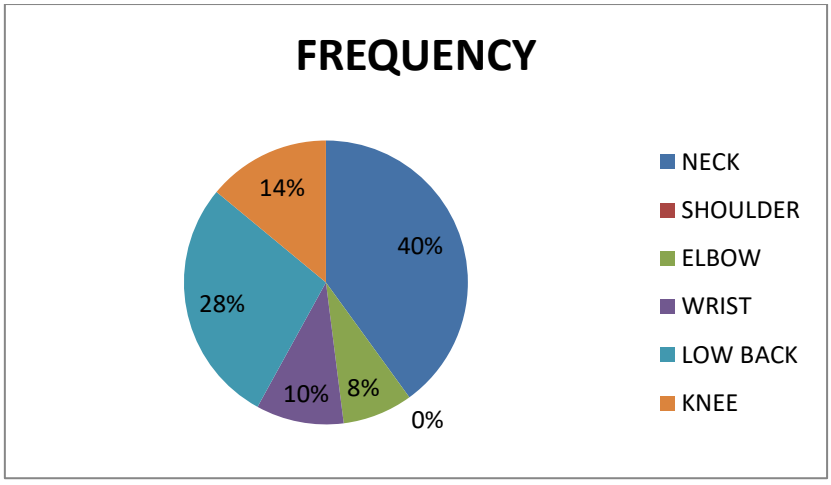
GRAPH 3- MEAN PERCENTIVE QUALIFICATION OF BANK EMPLOYEES N=100



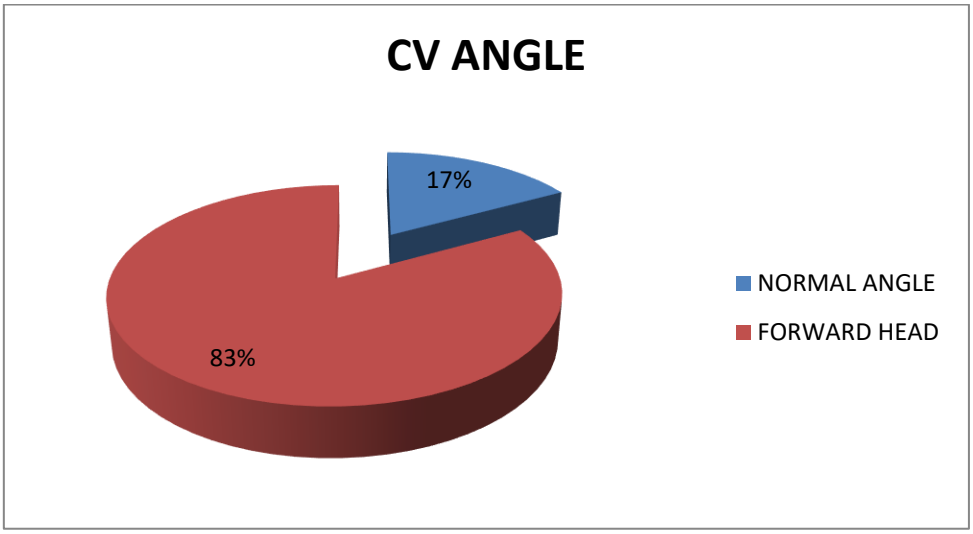
GRAPH 4- MEAN PERCENTILE OF WORKING EXPERIENCE PF BANK EMPLOYEES (N=100)



GRAPH 5- MUSCULOSKELETAL STATUS OF BANK EMPLOYEES (N=100)



GRAPH 6: CRANIOVERTEBRAL ANGLE OF BANK EMPLOYEES N=100



The analysis of data can be divided into 2 parts.

Part 1- Demographic profile of bank employees including their age, bmi, hours of working, no of year of experience, and part 2- analysis of craniovertebral angle using kinovea.

As per the value of craniovertebral angle, 83% were found to be having forward head posture, studies have revealed that office employees had more improper posture with forward looking while working with a computer (Not a working) position, it was due to poor ergonomics of chair, desk, computer positions and also lack pf attention paid to body position during work.

CONCLUSION:

- From this study it is concluded that majority of the bank employees are observed as having forward head posture.
- Major etiology of neck pain was found due to prolonged static posture and duty hours specifically in those who sit with bend neck.
- This study shows more effect of forward head on age group between 25-35.

REFERENCES:

1. Stanley M maduagwa Rebecca DW Maijindadi, Kunaba I Duniya, Adetoyoje Y. Oyeyemi , Ismaila A. Saidu, and Bukola J Aremu Stanley "Prevalence and Patterns of Work-related Musculoskeletal Disorders among Bankers"Maduagwu et al., Occup Med Health Aff 2014, 2:3 DOI: 10.4172/2329-6879.1000169rns

2. Babak fazli, Zahra sharif poor, Marzieh Noorani, Amir hooshang Mehrparvar, Sayed Mohammad Jafari "Evaluation the posture of bank employees by using two methods RULA and REBA" Recieved: 28 Apr 2014, Accepted : 5 Jan 2015.

3. Dae-Hyun Kim a, Chang-Ju Kim b,*, Sung-Min Son b,"Neck Pain in Adults with Forward Head Posture: Effects of Craniovertebral Angle and Cervical Range of Motion"Osong Public Health Res Perspect 2018;9(6):309−313 N Yasmin, MFA Bhuiyan, S Lahiry "Work-Related Musculoskeletal Disorders Among Computer Users“

4. Sourav Chakraborty, Debasish Sinha, Sita Chatterjee , Mausumi Basu, Raghunath Misra, "A Study on Work Related Neck Pain among Bank Employees in Kolkata, India"www.ijcmr.com, DOI: http://dx.doi.org/10.21276/ijcmr.2020.7.6.22

5. Aliaa Rehen Youssef , " Photogrammetric Quantification of Forward head posture is side dependent in healthy participants and patients with mechanical neck pain".

6. N Yasmin1, MFA Bhuiyan2, S Lahiry1 "Work-Related Musculoskeletal Disorders Among Computer Users"www.SEAES2008.org

7. Guluma Etana, “Prevalence of work related musculoskeletal disorders and associated factors among bank staff” http://www.dovepress.com/

8. Michel Aptel, “Work related musculoskeletal disorders of upper limb” S1297319X02004505/REV