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ORIGINAL ARTICLE

Risk Factors of Non-Specific Neck Pain in Students: Case Control Study

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Keywords

Non-specific neck pain, physiotherapy, Student

Author`s Contribution

1Interpratation, manuscript writing Discussion,
Data analysis
[2] Planning of research and manuscript writing,
Conception, synthesis

Article Info.

Received: June 7, 2018
Revised: July 23, 2018
Accepted: Aug 15, 2018

Conflict of Interest: Nil

Funding Sources: Nil

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Cite This article as: Saeed A, Raiz H. Risk factors of non-specific neck pain in students: case control study. JRCRS. 2018; 6(1):43-46.

A B S T R A C T

Back ground: Non-specific neck pain is very common in the general population. Every individual would have experienced neck pain at some point in their life. Incidence of non-specific neck pain is gradually increasing in young adults. Hence there is a need to identify the factors which lead to development of Non-specific neck pain in young adults.

Objectives: The objective of study is to determine the risk factors of Non-specific neck pain in students.

Materials and Methods: This case control study was conducted with 274 students with Age between 18 to 25 years. 137 students with neck pain (pain intensity >2) having chronic, acute or recurrent neck pain were recruited in neck pain group and 137 students without neck pain (pain intensity<2) were recruited in without neck pain group. Students with chronic disease of the musculoskeletal system (e.g. Polyarthritis, muscular disease), clinical features indicating 'red flag' pathology, Trauma or fracture around neck or arm and with Specific headache were excluded. Self-structured questionnaire was used to collect the data. intensity of neck pain, Questions regarding exercise habits, BMI, traveling hours, daily average hours of computer use, type of computer use, years of computer use, posture of computer use, daily average study hours were asked to determine the risk factors of neck pain in those students .Intensity of Non-specific neck pain was measured by numerical rating scale. Data was analyzed using SPSS version 20.0.

Results: Mean age of participants in neck pain group was 20.34 ± 1.59 years while in without neck pain group was 20.17 ± 1.79 years. The study demonstrated that various factors increases the risk of neck pain in students, less sleeping hours increases the risk to 1.259 times, greater travelling hours increases the risk to 1.358 times, more years of computer use increases the risk of Non-specific neck pain 1.30 times. Desktop use increases the risk to 1.18 times as compare to laptop use.

Conclusion: Current study showed that neck pain is greater in females and other factors like less sleeping hours, greater travelling hours, greater years of computer use, smoking, desktop use, computer use in improper sitting posture found to increase the risk of neck pain in students. While regular exercise, using postural support during computer use and keeping screen level horizontal to eye decreases the risk of neck pain.

Introduction

Neck pain is a very common problem affecting 60-70% of the population at some point in their lives. In 2003 prevalence in the Netherlands was estimated at 31.4% for neck pain.[1] 14-71% of adults have neck pain at some point in their lives. Its prevalence in adults ranges at 16-75% and 37% of people having neck pain patients will develop chronic neck pain.[2] Economic burden due to neck pain is gradually increases total yearly cost of neck and upper limb symptoms in the Netherlands in 2013 was 2.1 billion Euros.[1]

Incidence of musculoskeletal pain especially neck pain increases in all age groups, ranging at 48-

78% .[2] In a Swedish university students 15% developed neck or upper back pain.[3]

The cause of neck pain can be poor posture, neck strain, falls, whiplash injury, degenerative disc disease, herniated disc, or nerve compression. Some infections can also causes neck pain such as virus infection of the throat, may lead to lymph node swelling and neck pain, osteomyelitis, septic discitis, and meningitis other conditions such as fibromyalgia and polymyalgia rheumatic also cause neck pain.[4]

Biomechanical factors that lead to non-specific neck pain are forward head posture, computer use for a long time, computer use in improper posture, use of desks and chairs not ergonomically suitable, lack of exercise, longer study hours.[(5)] patient suffering from neck pain having feelings of clumsiness, tingling, stiffness of neck loss of strength of neck and arm muscles , temperature differences in the neck, shoulder, arm, elbow, wrist, hand and fingers [(1)] The longuscapitis and longuscolli, deep flexor muscles of the neck, play an important role in postural adjustment. Prolong positioning of neck in in appropriate positions lead to muscle imbalance and NSNP[6] NSNP is more prevalent in adults who spend more time in sitting and have relatively low physical activity and it present itself as a recurrent pain.[7]

The individuals who have non-specific neck pain in young age are at high risk of developing chronic neck pain in later years. Focus should be on reduction of incidence of neck pain in young individuals[2] because young individuals receives relatively little attention with regard to neck pain. Evidence suggests that frequent episodes of neck pain symptoms are also prevalent among young adults.[8] Complaints of neck pain may have significant effects on adult's education their professional career and productivity.[9] NSNP can affects range of motion and limits the functional capacity of neck and leads to altered head and neck posture. There is need to identify risk factors for development of non-specific neck pain in young adults so that those could be avoided to enhance quality of life of young adults.

Methodology

This is a Case Control Study conducted in physiotherapy department of Azra Naheed Medical College, Superior University, Lahore. Students with neck pain are taken as Cases and those without neck pain are taken as Controls. Numeric pain rating scale used to identify the neck pain. Students who mention neck pain intensity > 2 on numeric rating pain scale and having neck pain for more than two months were included in case group and who reported no neck pain or neck pain intensity <2 were included in control group study. Neurological disorders (i.e. Irradiated pain) and headache as a consequence of

Students with specific headache, malignancy and infection, trauma (i.e. Fractures) around neck or arm, chronic disease of the musculoskeletal system (e.g. Polyarthritis, muscular disease); clinical features indicating 'red flag' pathology were excluded Purposive sampling technique was used for data collection. Sample size was calculated by using used EPI Info tool to calculate sample size for this study. Considering 80% power, 95%confidence level and case–control ratio 1:1, we calculated that 200 participants required. 274 students were recruited, 137 students with neck pain (case) and 137 students were without neck pain (control). Semi-Structured questionnaire given to physiotherapy students. Questionnaire was distributed among the students, of all academic semesters. Questions regarding intensity of neck pain, exercise habits, body mass index, traveling hours, daily average hours of computer use, type of computer use, years of computer use, posture of computer use, daily average study hours were given to those students to determine risk factors of neck pain in those students.

Analysis performed by using Statistical Package of Social Sciences (SPSS) software version 21. Odds ratio was calculated to estimate the relative risk with 95% confidence interval.

Results

In Neck Pain Group, 95 (69.3%) were female and 42 (30.7%) were male and their average age was 20.34 ± 1.59 years while in Without Neck Pain Group, 73 (53.2%) were female and 64 (47.8%) were male and their average age was 20.17 ± 1.79 years. The severity of pain was 5.38 ± 2.13.

Women had almost twofold risk of NSNP as compare to males(OR=1.983, 95%CI=1.209-3.252)risk of NSNP also increased in smokers as compared to non-

smokers (OR=1.071, 95%CI=.517-2.218), sleeping < 6 hours per day increased risk of NSNP as compare to > 6 hours sleeping (OR=1.25, 95%CI= .761-2.085), travelling >2 hours per day increased the risk of NSNP (OR=1.358,95%CI=.835-2.209),computer use increased risk of NSNP as compare to non-computer uses (OR=1.553,95% CI=.988-2.643) desktop use increased risk of neck pain as compare to laptop use (OR=1.180,95%CI=.615-2.266), computer use >5 years increased the risk of NSNP as compare to <5 years computer use (OR=1.30,95%CI=.641-1.653),NSNP not increased by computer use >3 hours/day as compare to <3 hours/day (OR=0.915, 95%CI=.568-1.474), computer use while sitting in bed increased the risk of NSNP as compared to sitting in chair (OR=1.542,95% CI=.908-2.618), risk of NSNP was not increased with study >3 hours as compare to <3 hours study (OR=0.970,95%CI=.598-1.574), no postural support during study increased risk of NSNP as compare to postural support during study (OR=1.060,95% CI=.660-1.705), study while sitting in bed increased risk of NSNP as compare to study while sitting in chair (OR=1.224,95%CI=.700-2.138)

Table I: Odds ratio with respective 95% CI for variables related to NSNP

		non specific neck pain		Total	OR(95%CI)	p-value
		Yes	No			
Gender	Female	95	73	168	1.983 (1.209-3.252)	0.006
	Male	42	64	106		
Total		137	137	274		
Exercise	Regular	30	64	94	0.320 (.189-.541)	0.04
	Irregular	107	73	180		
Total		137	137	274		
BMI	> 18	84	91	175	0.801 (.489-1.313))	0.379
	< 18	53	46	99		
Total		137	137	274		
Smoking	Yes	17	16	33	1.071 (.517-2.218)	0.853
	No	120	121	241		
Total		137	137	274		
Sleeping hours	<6 hours	95	88	183	1.259 (.761-2.085)	0.369
	>6 hours	42	49	91		
Total		137	137	274		
Daily travelling hours	>2 hours	59	49	108	1.358 (.835-2.209)	0.021
	<2 hours	78	88	166		
Total		137	137	274		
computer use	yes	118	127	245	1.553(.218-1.095)	0.037
	No	19	10	29		
Total		137	137	274		
type of computer	Desktop	23	20	43	1.180 (.615-2.266)	0.618
	Laptop	114	117	231		
Total		137	137	274		
Years of computer use	>5 years	68	67	135	1.30 (.641-1.653)	0.090
	<5 years	69	70	139		
Total		137	137	274		
Average time of daily computer use	>3 hours	60	63	123	0.915 (.568-1.474)	0.716
	<3 hours	77	74	151		
		137	137	274		
postural support	yes	68	85	153	0.603 (.373-.975)	0.039
	No	69	52	121		
		137	137	274		
computer using position	sitting in bed	104	92	196	1.542 (.908-2.618)	0.108
	sitting in chair	33	45	78		
Total		137	137	274		
level of screen	Horizontal	83	97	180	0.634 (.383-1.048)	0.075
	below	54	40	94		
Total		137	137	274		
study hours	>3hours	54	55	109	0.970 (.598-1.574	0.902
	<3hours	83	82	165		
		137	137	274		
posural support	No	74	72	146	1.060 (.660-1.705)	0.809
	Yes	63	65	128		
Total		137	137	274		
position used for study	sitting in bed	107	102	209	1.224 (.700-2.138)	0.478
	sitting in chair	30	35	65		
Total		137	137	274		

** P-value significant at < 0.05.*

Discussion

This case control study provides a comprehensive overview of different factors that increase risk non-specific neck pain in students. The NSNP was substantially higher among female students than among male students which is consistent with findings of previous study done by Hoy et al in Australia [10] Abate et al suggested an association between smoking and musculoskeletal pain and current study also proposed that neck pain is greater in students with smoking habit (OR=1.071) as smoking has negative impact on musculoskeletal system and risk of musculoskeletal pain increases with smoking. This study showed that neck pain increases by decreasing sleeping hours OR=1.25 and with greater travelling hours OR=1.358. These results are in accordance with another study by Devereux et al[12] which implies decreased sleeping and greater travelling hours as risk factor for NSNP as increase travelling causes more muscle stress and increase travelling leads to increase back as well as neck pain. Current study showed that neck pain is more in students who spent more hours in front of computer these findings are in agreement with findings of Kanchanomai et al, Alshagga et al[13,14] because greater computer using hours leads to more tissue stress and muscle fatigue.

Current study depicts that Neck pain is greater in desktop users as compare to laptop users with OR=1.180 because with desktop use the neck position cannot be changed frequently and sustained position holding especially in improper posture lead to neck pain study by Hamilton et al also show congruency with this finding.[15] Increased years of computer use propose to increase NSNP, this result goes in favor of study by Schlossberg et al presented that computer using years a threshold for neck pain because by computer use in improper posture for prolonged period of time leads to pain in neck and upper back.[16] Current study showed that computer use while sitting in bed shown to increase the risk of NSNP as compared to sitting in chair OR=1.542 because computer use while sitting in bed the back is not properly supported and neck goes into more flexion these factors leads to neck pain development and this result goes with results of Marcus et al.[17]

This study carried out in just one institute, ergonomic evaluation of posture of students while using computer or during study was not done and association of psychological factors with NSNP was not analyzed. Even with these limitations this study can provide good information about different factors that increases the risk of NSNP.

Recommendation: Future research needed on exploring preventive strategies for NSNP, postural intervention required for prevention of NSNP and studies on ideal ergonomic positioning for computer use and for study to prevent NSNP in young adults.

Conclusion

Study showed that neck pain is greater in females and other factors like less sleeping hours, greater travelling hours, greater years of computer use, smoking, desktop use, computer use without postural support and computer use in improper sitting posture found to increase the risk of neck pain in students. While regular exercise, using postural support during computer use and keeping screen level horizontal to eye decreases the risk of neck pain.

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