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Shift Work Disorder and Associated Health Problems among Doctors in a Tertiary Teaching Care Hospital, Andhrapradesh

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Abstract:
Introduction: *Shift work disorder(SWD) is a circadian rhythm sleep disorder characterized by insufficient or excessive sleepiness occuring in people whose work hours coincide with the typical sleep period.A shift worker is anyone who follows a work schedule that is outside of typical 9am to 5pm business day.*
Objective: *To assess the prevalence of SWD and other related health problems among doctors in a government established tertiary teaching care hospital.*
Materials And Methods: *Arandomised prospective study was conducted in a tertiary care teaching hospital,tirupati, andhrapradesh for 3months ,that is from august to October,2019.A total of 150 doctors were randomly selected. Informed consent was taken from the participants. They were given two questionnaires which include "standard shift work index questionnaire"(SSWIQ) and "Bergen shift work sleep questionnaire(BSWSQ)".Each questionnaire contains a battery of relatedquestions. Both the indices were analysedstatiscally.*
Results: *The prevalence of SWSD is about 24.6%according to SSWIQ and about 28.6% according to BSWSQ. We found that there was no significant association between the presence of SWD according to SSWIQ and BSWSQ.(P=0.43). Fatigue(80%) was the most common complaint among other correlated health problemsfollowedby backache ,epigastricpain, headacheand menstrual irregularities.*
Conclusion: *The study showed increase in SWD in shift workers. This can be minimized by rotating shift every 2 weeks,maximizing leisure time,exposure to bright light and melatonin treatment.However if SWSD is severe it is advised to take medications that promote alertness like caffeine ,modafinil and armodafinil which have been approved by FDA.*

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I. Introduction

A doctor is a person who is trained and licensed to treat sick and injured people and with a medical degree.He is someone licensed to practiced a healing art.In INDIA there is one government doctor for every 10189 people according to WHO and it recommends a ratioof 1:1000.According to 2014 statistics ,there are about 9.4 lakh medical practioners in INDIA .In this scenario,there is lot of pressure on doctors for better performance .The common ailments in medical practioners are psychological problems (anxiety and depression) and sleep related problems.In this research article we concentrate on shift work sleep disorder[1].This is

a profession where doctors have to do night duties once/twice or thrice a week.It is generally agreed that such night shift duties have detrimental effect on the individual concerned.The most important effect is on the sleep resulting SWD[2].Total daily sleep is usually shortened and sleep quality is less compared to normal sleep.The medical practioneer may suffer from either sleepiness or insomnia.Sleepiness is manifested as a desire to nap ,unintended dozing,impaired mental acuity ,irritability,reduced performance and accident prone.Insomnia may occur due to misalignment in endogenous circadian rhythm.The other associated health problemsare fatigue,backache,epigastricpain,headache and menstrual disorder[**3]s**.Though this study is about SWD]other related problems have also been studied.Now let us discuss the core of this research article.It is about SWD in doctors .We have used two indices to study SWD [4] and they are standard shift work index questionnaire (SSWIQ)and Berger shift work sleep questionnaire(BSWSQ).These indices [5]]will be elaborated in section of materials and methods.

Obligation of Study:

There is deficit of research papers on SWD especially in doctors.This study will highlight the health problems in medical practioneer due to night duties.There after ,interventions can be planned to improve the

quality of work life in doctors which in turn improves the quality of patient care and there by beneficial for their management .

Objectives:

As mentioned in the abstract ,objective is to study the prevelance of SWD[6] and other related health problems in doctors in a government established tertiary teaching care hospital in Tirupati ,AP.

II. Materials And Methods

STUDY DESIGN:Randomised,prospective study.
STUDY SUBJECTS:Doctors in tertiary care teaching hospital in tirupati.
INCLUSION CRITERIA :Postgraduates and assistant professors in various departments like casuality,obstetrics and gynecology,medicine,surgery,orthopedics and pediatrics.These doctors are included in this study because they are more exposed to night duties.
EXCLUSION CRITERIA:Professors are excluded as they are less exposed to night duties and moreover their number is less.
STUDY SETTINGS:This study is done in the department of pharmacology in Sri Venkateswara Medical College,Tirupati.
STUDY PERIOD:Three months (august,September and October in the year 2019)
SAMPLE SIZE:The study population comprised of 150 doctors.
STUDY METHODS:Doctors were selected by simple random sampling and informed consent was obtained from sample population.Demographic details regarding age in years,sex,maritalstatus,place of stay and working experience was collected.After that history of work schedule which includes number of night duties in the last 12 months and duration of work experience (<2 yrs and <2yrs)was obtained.After that assessing SWD and other correlated health problems were studied.These include fatigue ,backache,epigastricpain,headache and menstrual disorders[7].Percentage of incidence of these problems in 150 doctors are calculated.To these doctors SSIQ and BSWSQ were given.

SSIQ includes the a battery of questions.Of these important questions are regarding sleep [8]disturbance and sleep quality[9] and chronic fatigue.The other questions include problems associated with physical and mental health.The physical complaints include digestive system symptoms.cardiovascular symptoms and menstrual irregularities.Mental symptoms include lack of self confidence,depression,anxiety and lack of job satisfaction. The questionnaire was analysed by LIKERTS SCALE.

BSWQ:This questionnaire includes 7 questions which are stated below.1)how often has it taken you more than 30mts to fall asleep after the light is switched off.2)how often are you awake for more than 30mts within your main sleep period.3)how often have you woken up more than 30mts earlier than you wished,without being able to fall asleep again.4)how often have you not felt adequately rested following sleep.5)how often have you been tired /sleepy [10]at work.6)how often have you been tired/sleepy on your free time on work days.7)how often have you been tired/sleepy on rest days/on vacation.The questionnaire was analysed by LIKERTSCALE.Accodingly "never" is graded as 1, " rarely" as 2, "sometimes" as 3, "frequently" as 4 and finally, "always" as 5.

Statistics And Analysis Of Data:

The data was entered in Microsoft excel and was analysed using statistical pacakage for social sciences(SPSS) version 16,for proportions,frequencies and associations.Measurements of central tendency ,dispersion and chi-square test were used to analysedata.p-value less than 0.05 was considered significant.

III. Results

The sample size is 150 doctors.Of these 53% were females and 46.7%were males.Doctors aged more than 40 were 38(25.33%).About 92(61.3%)stayed at house and 82(54.7%)were married.(Table 1).The largest group where number of days of night shifts weredone in the last 12 months is 100 duties(66.7%).The number of doctors with work experience more than 2 years were 78(52.2%)(Table 2).The commonest health problem in shift workers is fatigue(80%),followed by back ache,epigastric pain and headache.Out of 80 females 45 suffered from menstrual irregularities(56.25%).(Graph:1).

Incidence of SWD according to SSWIQ is 8.6% in age less than 30 yrs,8% in age group 31-40 and 8% in the age group more than 40 yrs.The p value in the above study is 0.46 and so is notsignificant.The incidence of SWD according to SSWIQ IS 9.3% in years of experience less than 2 yrs and 23% in persons with experience greater than 2 yrs.The p value is 0.15 and so is not significant.(Table:3)

Accorrding to Table :4,the incidence of SWD according to BSWSQ in age group less than 30 yrs is 9.3% and in age group 31-40 is 9.3% and finally in age group more than 40 yrs is 15%.The p value is 0.18 and

so is not significant.The incidence of SWD in less than 2 yrs of experience is 12% and 13.3% in persons with experience more than 2 yrs.The p value of the study is 0.92 and so is not significant.

On comparing the incidence of SWD according to SSWIQ and BSWSQ the p value is 0.43 and so is not significant.(Table: 5,Graph:2,3)

TABLE: 1 DEMOGRAPHIC DETAILS(n=150)

	Category	number	percentage
Age	<30 yrs- 31-40 >40 yrs	63 49 38	42% 32.67% 25.33%
sex	Male female	70 80	46.7% 53.3%
Mariatal status	Married Unmarried Separate/divorce	82 41 27	54.7% 27.3% 18%
Place of stay	Hostel house	58 92	38.7% 61.3%

TABLE: 2 WORK SCHEDULE

variable	category	numbers	percentage
number of days of night shifts in the last 12 months	50 50-100 >100	35 100 15	23.3% 66.7% 10%
work expereince	<2yrs >2yrs	72 78	48% 52%

GRAPH: 1

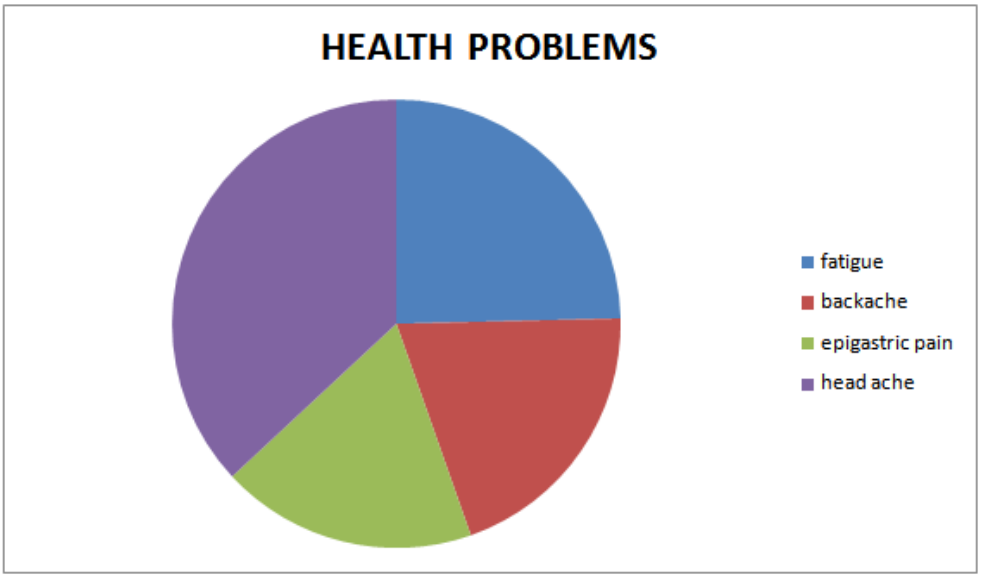


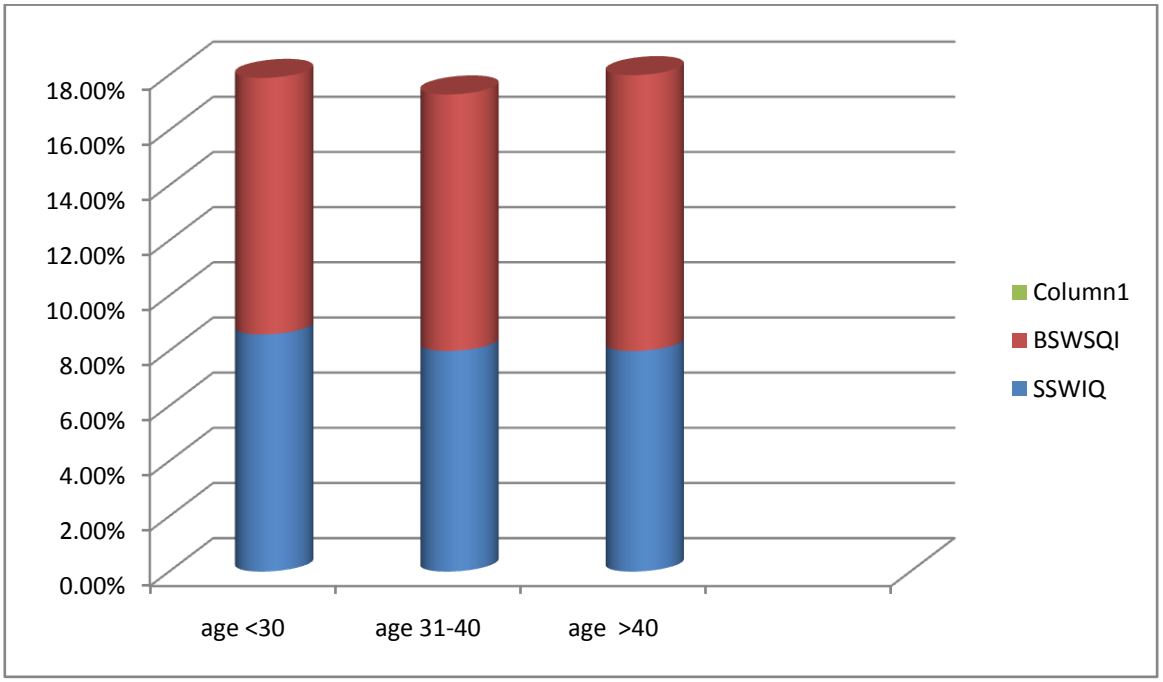
TABLE: 3 INCIDENCE OF SWD ACCORDING TO SSWIQ

		PRESENCE OF SWD	ABSENCE OF SWD	P value
age	<30yrs 31-40yrs >40yrs	13(8.6%) 12(8%) 12(8%)	50(31.3%) 37(24.6%) 26(17.3%)	P=0.46
Years of experience	<2yrs >2 yrs	14(9.3%) 23(15.3%)	58(38.6%) 55(36.6%)	P=0.15

TABLE: 4 INCIDENCE OF SWD ACCORDING TO BSWSQ

		PRESENCE OF SWD	ABSENCE OF SWD	P-value
age	<30 yrs 31-40 yrs >40yrs	14(9.3%) 14(9.3%) 15(10%)	49(32.6%) 35(23.3%) 23(15.3%)	P=0.18
Years of experience	<2yrs >2yrs	18(12%) 25(16.6%)	54(36%) 58(38.6%)	P=0.92

GRAPH: 2 COMPARISION OF INCIDENCES OF SWD ACCORDING TO SSWIQ ANS BSWSQ IN AGE GROUPS



GRAPH :3 INCIDENCE OF SWD ACCORDING TO SSIQ AND BSWQ IN RELATION TO YEARS OF EXPEREINCE

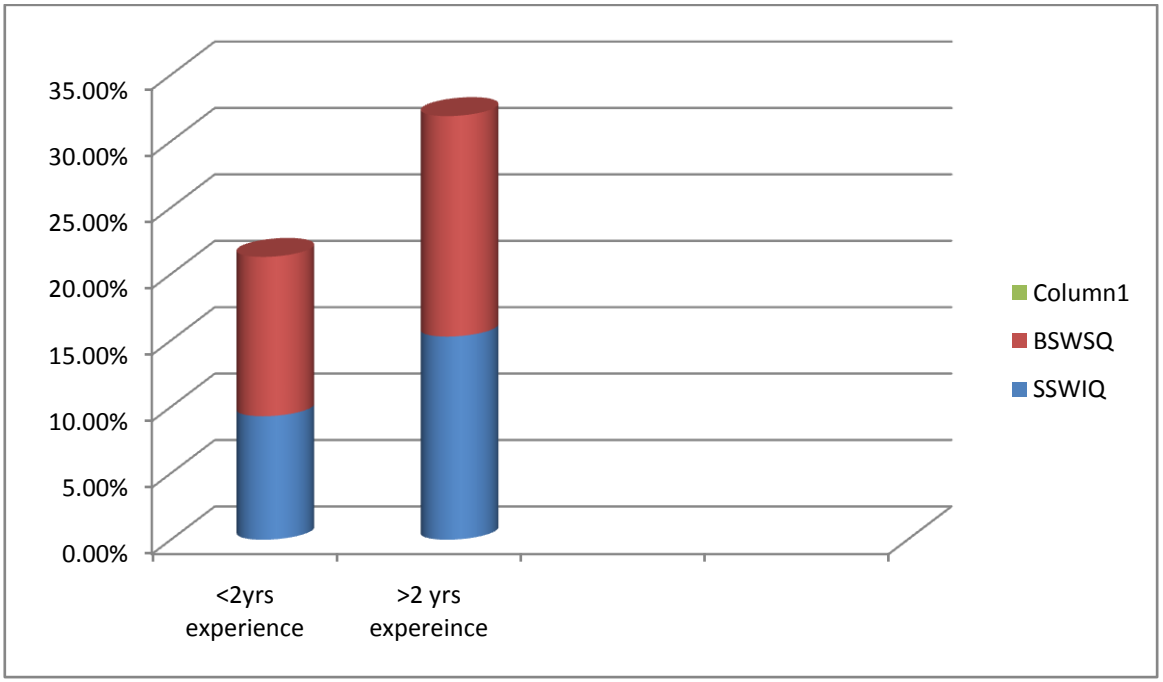


TABLE :5

	SSWIQ	BSWSQ	P VALUE
PRESENCE OF SWD	37(24.6%)	43(28.6%)	P=0.43
ABSENCE OF SWD	113(75.3%)	107(71.3%)	

IV. Discussion

In this study we found that incidence of SWD is more in age group less than 30 yrs compared to age groups above 40.This could be because younger generation have not yet adapted to this night shift work experience..The incidence of SWD is more in people with more than 2 yrs of experience.When SWD incidence

is compared in SSWIQ and BSWSQ ,the p value was to be 0.43 which is not statistically significant. The circadian rhythms are maintained by suprachiasmatic nucleus(SCN) in the anterior hypothalamus in brain.Photoreceptors located in the retina of eye send information to SCN through retinohypothalamictract. The SCN regulates the secretion of melatonin by pineal gland.It is believed that SCN firing is reduced during sleep.While day active individuals produce melatonin at night ,night shift workers produce less melatonin due to light exposure.There are a lot of studies regarding SWD.In 2007 study led by IARC(International agency for research on cancer)[11] showed that shift workers have been associated with the risk of cancer.Michael.et.al. demonstrated that those working night shifts[12] had a significant higher risk of hazardous driving events, when compared to the typical day shift schedule .There is increased incidence of fatigue, backache, epigastricpain, headache, mental disorders like cognitive impairment, depression, difficult to concentrate etc.

V. Conclusion

The exclusion of night duties in doctors is impossible.So there is dire need to prevent and diagnose SWD.Some of the prophylactic measures we can take is rotating night shifts[13,14] every two weeks.Some experts adovacatedshort runs (1 or 2days) of night work with time for recovery. Once diagnosed of SWD ,bright light treatment (bright light exposure in the evening or first part of night,avoiding bright light in the morning).The other measures is melatonin treatment. Melatonin[15]has been shown to accelerate the adaption to circadian system to a night time work schedule. The other medications that promote alertness are caffeine[16] ,modafinil and armodafinil[17] approved by FDA.

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