



Factors influencing sleep quality among nursing staff: Results of a cross sectional study



K. Kunzweiler, MPH^a, K. Voigt, MPH^{a,*}, J. Kugler^b, K. Hirsch^c, A. Bergmann^a, H. Riemenschneider, MA, MPH^a

^a Technische Universität Dresden, Department of General Practice, Medical Clinic 3, Dresden, Germany

^b Technische Universität Dresden, Department of Public Health, Medical School Carl Gustav Carus, Dresden, Germany

^c Harzklinikum Dorothea Christiane Erxleben GmbH, Educational Centre, Quedlinburg, Germany

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ABSTRACT

Purpose: Given the intense physical and mental demands placed on nurses and other caregivers, getting sufficient sleep is essential to maintaining both individual health and professional performance. The goal of our study is to describe and analyze the self-reported sleep quality of nursing staff and identify which factors have an influence on it.

Methods: The sample was comprised of 153 female nurses over the age of 20 years who completed written surveys regarding their health status and health behavior. Their responses were subjected to ANOVA analysis with post hoc follow-up tests and logit regression was used.

Results: 33% of female nursing staff reported poor quality sleep. Lower quality of life, tachycardia and unequal distribution of work load were most strongly associated with poor sleep quality.

Conclusion: Our study indicates that reducing workplace stress is a good place to start in developing a proactive strategy. A comprehensive prevention strategy should include both behavioral and situational prevention elements. Future studies should focus on identifying causal factors and developing prevention strategies.

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1. Introduction

High quality sleep and feeling well rested are important conditions for health and productivity (Penzel, Peter, & Peter, 2005). Most adults spend an average of eight hours a day sleeping, and another eight hours at work (Burgard & Ailshire, 2009). The Federal Health Report of the Robert Koch Institute indicates that more than a quarter of all German adults report suffering from sleep disorders of some kind and 13.6% of men and 10.3% of women seek medical care as a result (Penzel et al., 2005; Schlack, Hapke, Maske, Busch, & Cohrs, 2013). Riemann, Baglioni, Feige, and Spiegelhalter (2014) found that approximately 10% of the population of western industrialized countries are affected by chronic sleep disorders.

Restorative sleep is particularly important for people with highly demanding jobs. Sleep quality is defined by several criteria, including length of sleep (4–10 hours daily), time needed to fall asleep, frequency of waking, and wellbeing at wake up (Burgard & Ailshire, 2009). Nursing staff face particularly significant physical and mental challenges daily, including physical strain, hectic schedules, and regular interaction with disease and death (Tracogna, Klewer, & Kugler, 2002). According to the 2007 Federal Statistical Office microcensus (Statistisches Bundesamt, 2009), nursing staff cite poor posture, body movement,

handling heavy objects, time pressure and overwork among the most common challenges of their work.

Sleep disruptions, including difficulty falling asleep or staying asleep, as well as frequent daytime fatigue, are commonly associated with physical exertion (Akerstedt, Knutsson, et al., 2002; Burgard & Ailshire, 2009), excessive or insufficient stress (Akerstedt, Fredlung, Gillberg, & Jansson, 2002; Burgard & Ailshire, 2009; Knudsen, Ducharme, & Roman, 2007; Niedhammer, David, Degioanni, Drummond, & Philip, 2009), and low job satisfaction (Karagozlu & Bingöl, 2008; Strathopoulou, Panagiotopoulou, & Papanthanasoglou, 2011). According to Karagozlu and Bingöl (2008) sleep quality increases proportionally with job satisfaction.

Shift work, too, can contribute to health problems, including insomnia, anxiety, and increased risk of injury or unhealthy behaviors, e.g. smoking (Akerstedt & Wright, 2009; Horwitz & McCall, 2004; Rodenbeck & Hajak, 2010; Smith, Fritsch, Reid, & Mustard, 2013). International studies show that sleep disorders affect nursing staff in all shifts and schedules (Chan, 2008; Flo et al., 2012, 2013; Hasson & Gustavsson, 2010; Ohida et al., 2001). Further consequences of poor sleep quality include back pain and high blood pressure (Gangwisch, Feskanich, Malaspina, Shen, & Forman, 2013; Lövgren, Gustavsson, Melin, & Rudman, 2013; Spiegelhalter, Scholtes, & Riemann, 2010; Tracogna et al., 2002).

According to the Federal Statistical Office (Statistisches Bundesamt, 2013), of the estimated 826,000 nurses and 275,000 nursing assistants in Germany (data from 2011), 85.5% and 70.2% are women, respectively.

* Corresponding author at: Technische Universität Dresden, Department of General Practice/Medical Clinic 3, Fetscherstraße 74, 01307, Dresden.

E-mail address: Karen.Voigt@uniklinikum-dresden.de (K. Voigt).

International studies show that females suffer worse sleep quality than their male counterparts (Hasson & Gustavsson, 2010; Karagozoglu & Bingöl, 2008). Age is also a factor that influences the quality of sleep. Women over 50 years old are more likely to suffer from interruptions of sleep than their younger colleagues (Akerstedt, Fredlung, et al., 2002; Akerstedt, Knutsson, et al., 2002; Chan, 2008; Sivertsen, Krokstad, Overland, & Mykletun, 2009).

While international studies have examined the sleeping habits of health care workers, to date, German studies have had their focus on doctors and nursing students (Hirsch, Voigt, Gerlach, Kugler, & Bergmann, 2010; Von Lindeman, Kugler, & Klewer, 2011). A search of the literature using the PubMed database did not turn up a single study of the sleep habits of nursing staff in Germany. Considering the importance of health and performance in this industry, and the rising workload caused by the shortage of qualified staff (Hirsch & Lindenberg, 2013), this topic merits further study. Furthermore, this relevance is not limited to Germany. The growing health worker issue is a concern for a number of European countries.

The aim of our study is to describe and analyze the self-reported sleep quality of nursing staff and identify which factors have an influence on it. Based on the prior studies, the current research examined the correlations of age, quality of life, and the presence of tachycardia or back pain with poor sleep quality. We also examined whether unequal distribution of work load or staff shortages were associated with reduced sleep quality.

2. Methods

This cross sectional study of health risks and behaviors is based on an anonymous, voluntary mail survey of all employees of the Dorothea Christiane Erxleben Quedlinburg Clinic GmbH (Quedlinburg Clinic) in Saxony-Anhalt state. The survey was undertaken between July and September of 2011 by employees of the Technical University of Dresden in cooperation with the Quedlinburg Clinic.

2.1. Participants

A total of 306 (31%) of the 989 employees of the Quedlinburg Clinic participated, including 302 (30.5%) nursing staff. The response rate among nursing staff was 55.6% ($n = 168$). Given the small number of male respondents ($n = 14$, 35%), only the female nursing staff ($n = 153$) were considered. One respondent did not indicate the sex, and was thus excluded from the evaluation.

2.2. Measures

The partially standardized questionnaire used in this study was developed as part of a World Health Organization project, and later adapted for further studies of TU Dresden concerning health behavior of medical students and medical staff (Klewer & Kugler, 2000; Voigt et al., 2009). It consists of 50 questions including socio-demographic information (age, occupation), health status and behavior (sleep quality, quality of life, athletic activity, tobacco and alcohol use), work conditions (workload, job satisfaction), and medical history (tachycardia, circulatory problems, back pain). The dependent variable sleep quality is rated along a visual analogue scale (VAS) from 0 (=very bad) to 10 (=very good).

2.3. Procedures

The study was undertaken between June 1 and September 30, 2011 in the Quedlinburg Clinic (Saxony-Anhalt). Questionnaires were distributed by mail with employees' salary statements. Information sessions were held at the clinic to explain the purpose of the study to potential participants and answer any questions. Completed questionnaires

were then deposited in sealed containers placed in central locations at the clinic.

2.4. Analysis

The data were analyzed using SPSS Statistics software, version 21. ANOVA was used (we assumed an approximately normal distribution) with post hoc comparisons using Bonferroni corrections. Predictors of subjective sleep quality were tested using logit regression. Independent variables were included in the model based on their statistical and formal significance. A p value of 0.05 was used. For the logit regression, the response variable was dichotomized to group the outcomes into binary categories. Scores of 0–5 were considered low sleep quality while 6–10 were high quality. Defined this way, we were able to identify significant correlations between the independent variables and sleep quality (see Table 1).

3. Results

3.1. Characteristics of the sample group

The largest age group in the sample of female nursing staff, at 41.8% ($n = 64$), was 41–50 year olds. 13.7% ($n = 21$) were between 20 and 30 years old. 32.7% of female nursing staff respondents reported low sleep quality (0–5), with the remaining 67.3% claiming high quality (6–10, see Table 2).

3.2. Age and sleep quality

Of the female nursing staff in the sample, 33% ($n = 17$) of those under 40 years of age, 34% ($n = 22$) of those between 41 and 50 years old, and 30% ($n = 11$) of those over 51 years old rated their sleep quality as poor (ANOVA: $F = 0.09$, $p \geq 0.05$, $df = 3$, n.s.).

3.3. Quality of life and sleep quality

A significant correlation was observed between subjectively reported quality of life and sleep quality (ANOVA: $F = 6.42$, $p \leq 0.01$, $df = 2$). The post hoc test showed that female nursing staff with good quality of life had on average a significantly higher sleep quality (6.81 , ± 2.01) than those that with average quality of life (5.65 ± 2.11 , $p \leq 0.05$) and those with poor quality of life (4.40 ± 3.29 , $p \leq 0.05$).

3.4. Medical conditions and sleep quality

The presence of tachycardia/circulatory problems (ANOVA: $F = 13.45$, $p \leq 0.001$, $df = 2$) and back pain (ANOVA: $F = 8.75$, $p \leq 0.001$, $df = 2$) also showed significant correlations with poor reported sleep

Table 1
Independent variables included in the logit model.

Variable	Responses
Subjectively experienced quality of life	Good quality of life 7–10 Poor quality of life 0–6
Medical conditions: Tachycardia/circulatory problems, neck pain, back pain	Never, sometimes, often, always
Unequal distribution of work load: Sometimes I have too much, other times too little to do	Agree, partially agree, disagree
Overwork Due to Staff Shortages	Agree, partially agree, disagree
Subjective job difficulty	Too challenging, challenging, not challenging enough
Content with work schedule	Satisfied, somewhat satisfied, unsatisfied
Content with pay	Satisfied, somewhat satisfied, unsatisfied
Content with break times	Satisfied, somewhat satisfied, unsatisfied

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