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Workplace bullying in the Neonatal Intensive Care Unit environment: a questionnaire survey

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ABSTRACT

Objectives: The aim of this study is twofold, to examine the prevalence and health impact of bullying behaviors and to investigate whether psychological support at work could affect victims of bullying in the health care workplace.

Design: Self-administered questionnaire survey.

Setting: 20 in total Neonatal Intensive Care Units in 17 hospitals in Greece.

Participants: 635 healthcare professionals (Doctors, Nurses).

Main outcome measures: The questionnaire was divided into four sections which included information on demographic data, Negative Act Questionnaire (NAQ-R) behavior scale, data on sources of bullying, perpetrators profile, causal factors, actions taken, and reasons for not reporting bullying, psychological support, and General Health Questionnaire (GHQ-12) scores to investigate psychological distress.

Results: The study was carried out, with 398 respondents (Response rate 62.7%). Prevalence of bullying measured by the NAQ-R was 53.1 % for doctors and 53.6% for nurses. Victims of bullying differed from non-bullied in terms of gender and job experience, among demographic data. Crude NAQ-R score was found higher for female, young and inexperienced employees. Self labeling as a victim was referred in 27.9%; 44.9% of respondents who experienced bullying self labeled themselves as a victim of bullying. Witnessing bullying of others was found 83.2%. Perpetrators were mainly females 45-64 years old, most likely being supervisor/senior colleague. Common reasons for not reporting bullying was self-dealing and fear of consequences. Bullying was attributed to personality trait and management. Those who were bullied, self labeled as a victim and witnessed bullying of others had higher GHQ-12 score. Moreover, psychological support at work had a favor effect on victims of bullying.

Conclusions: Prevalence of bullying and witnessing were found extremely high, while half of victims didn't considered themselves as sufferers. The health impact on victims and witnesses is severe and support at work is necessary to ensure good health status among employees.

Strengths and limitations of this study

- This is the first study globally aiming to investigate Workplace Bullying in a Neonatal Intensive Care context.
- Workplace Bullying is one of the main problem medical personnel faces in recent years and studying its prevalence and its impact on behaviors is at the top of the research agenda for many academics and practitioners in healthcare worldwide.
- The instrument used in the study does not provide substantial causal evidence or identification of risk factors related to bullying in healthcare employees.
- Issues of prevention and mechanisms of controlling and management of bullying were not included in this study and this is a topic for a next research.

INTRODUCTION

Workplace bullying has long been recognized as a serious, disruptive problem in modern healthcare organizations. [1-4] Bullying aggressive behavior is defined by criteria as: intention to cause harm or distress, imbalance of power between the bully (perpetrator, aggressor) and the victim (target), and repeatability over time. The majority of definitions, centers on the perception of the victim, but differ in terms of duration, frequency and behavioral acts. [2,3] Additionally, bullying is characterized by persistency (in terms of duration and frequency), by the victim's inability to defend himself/herself, and by the negative impact on the victim.[3,5-9] Bullying behavior research is based mainly on two approaches: (a) the self-labeling, by asking the respondents if they perceive themselves as being bullied and (b) the behavioral experience approach, based on valid, well structured, scientifically sound measure scales. Prevalence rates of workplace bullying depend on the methodology, research design and cultural/geographical characteristic.[8,10] Therefore, bullying varies among countries and working sectors; people working in administration and services are bullied more often than those in production, research or education.[7,10-13] Nielsen et al. in their met analytic study, with the self labeled method with and without a given definition of bullying found a prevalence of 11.3 % and 18.1% respectively, while the behavioral approach revealed a rate of 14.8%.[14]

Bullying behavior is particularly high in health care service. Prevalence in the health sector has been reported from 3-8% up to approximately 40%, depending on the definition used. [3,5,15] Reports from NHS trust showed that a 1/3 among staff[3], 44% of nursing staff[16], 37% of doctors[15] in training had experienced bullying, and from US 42-84% medical students had

suffered from mistreatment throughout medical school.[17] More recently, surveys conducted between 2005-2011 for NHS staff showed a prevalence of 15-18% that rose to 24% in 2012.[2]

Despite public awareness, government funded research and anti-bullying legislation, bullying still provokes serious problems, sometimes with detrimental effects on both staff's health and quality of healthcare in hospitals. Clinical impact of bullying in hospitals can be psycho somatic symptoms among healthcare professionals; victims of bullying suffer from anxiety, depression, occupational job stress, job dissatisfaction)[18], burnout syndrome[19], musculoskeletal complaints, increased risk for cardiovascular disease and drug abuse.[20,21] Bullying is considered a long-lasting threat for psychological and healthcare problems as longitudinal designed studies have established.[12,20,22]

Additionally bullying is associated with increased abseentism[1,23], career damage, poorer job performance, lower productivity resulting in poorer quality of healthcare services and patient care [2,8]; in the health sector, bullied doctors make more often medical errors while bullied nurses may have lower levels of commitment and turnover.[1,24-26] Bullying and related negative acts are reported in many studies of physicians, nurses, medical personnel and staff working in Intensive Care Units. The challenging environment of Neonatal Intensive Care Units (NICUs) exposes medical and nursing staff to stress very often on a daily basis. Competition, conflicting demands of professional and personal life[27], excessive workload, difficult working conditions, pressure for prompt diagnosis and difficult decisions about end-of life care contribute to excessive stress. Bullying adds burden in the NICU's pressurized and stressful environment, and by exposing healthcare staff to more stress increases associated psychological distress.[28,29] It is therefore suggested that stress by creating a vicious cycle with psychological distress, promotes victimization.[8,14] As most occupational stress models support, stressors in the work environment generate physical, psychological or behavioral changes for employees.

In our knowledge, there is no research evidence on bullying in the NICU environment except a letter by Patole and Koch.[30,31] Given the paucity of research data and the major impact of bullying on staff's health and patient care, the current nationwide survey was conducted for workplace bullying in Greek Neonatal Intensive Care Units.

The objectives of this study were: (1) to assess the prevalence of workplace bullying in the NICU environment and to examine differences between employees; also to assess witnessing (2) to investigate sources, characteristics of perpetrators and attitudes, (3) to examine the impact of bullying on healthcare professional's health and (4) to investigate whether support at work can protect staff from adverse effects of bullying.

METHODS

Participants

An anonymous paper questionnaire was sent to physicians and nurses to all 635 healthcare professionals (Doctors, Nurses) in 20 Neonatal Intensive Care Units at 17 hospitals with a prepaid return envelope. Other health care employees were excluded due to inconsistent presence in NICU's everyday life. A covering letter explaining the purpose of the study was also included and they received a reminder after approximately 4 weeks. The questionnaire consisted of four sections:

Questionnaire

Section 1 of the questionnaire collected information about the participant's job professional group, job grade, qualifications/educational level, job contract, job time experience in the field and hours worked /week. Data for gender, age, body mass index (BMI), physical activity, smoking, drinking were also collected.

Section 2 included NAQ-R (Negative Acts Questionnaire-Revised) a bullying inventory. NAQ-R was translated from English into Greek language by team researchers and a bilingual English teacher back translated the instrument. The retranslated English version and the original were discussed to confirm agreement in each item for linguistic equivalence.

NAQ-R provides prevalence data for each of the 22 negative behaviors as well as an overall mean score (for an objective approach of bullying). Respondents were asked to rate how often they had experienced each negative behavior from other staff using a five-point frequency scale (1=never, 2=now and then, 3=monthly, 4=weekly, 5= daily). The overall NAQ-R mean score can range from 22 (meaning that the respondent 'never' experienced any of the 22 negative behaviors) to a maximum of 110 (meaning that the respondent experienced all of the 22 negative behaviors on a daily basis).[32] If ≥ 3 items were unanswered, then the NAQ score was considered missing.[33] A NAQ-R ≥ 33 total score was considered indicative of being a victim of bullying behavior.[32] The internal consistency of NAQ-R as measured by Cronbach's alpha was found quite satisfactory at 0.95.

Additionally, for a subjective approach, NAQ-R includes a self labeled definition of bullying (stem question). The definition used was: "bullying is a situation where one or several individuals persistently over a period of time perceive themselves as being the receivers of a series of negative actions, from one or more several persons, in a situation where the target of bullying has difficulty in defending him or herself against these actions. We will not refer as one-off incident as bullying". Respondents were asked to respond on a five-point scale (1=no, 2=yes, but only rarely, 3=yes, now and then, 4=yes, several times per week, 5=yes, almost daily). NAQ-R also examines whether respondents experienced bullying behaviors from peers, senior staff, or managers in the past 6 months.[34]

Section 3 collected data on perpetrators' profile (age, gender, and status), causality, actions taken (whether they reported bullying behavior to any authority) and reasons that bullying was not reported.

At section 4 data were reported on health impact using General Health Questionnaire and psychological support at work. The 12-item General Health Questionnaire (GHQ-12), an efficient, reliable, and well validated indexed scale, was used to assess psychological distress.[35,36] GHQ data is scored as a 4-Likert scale (from 0 to 3), to measure severity. Results were evaluated at the more conservative cut-off of ≥4 used in healthcare research for psychological impairment.[29] The scale had a satisfactory internal consistency with Cronbach's alpha of 0.90. Support at work was measured as a dichotomous scale with a yes/ no response if the respondents received psychological support or not. The project was approved by participating Hospital's Scientific Committee's for Medical Research Ethics.

Frequency analysis for socio-demographic characteristics and item analysis were used to know the internal consistency of NAQ-R and GHQ-12 by calculating Cronbach's alpha coefficient; exploratory analysis (principal component analysis) was carried out to identify factor structure of NAQ-R and GHQ-12. Continuous variables were expressed as mean ± standard deviation (SD). Student t test or Mann-Whitney test was used to compare continuous variables and χ^2 test or Fisher exact test to compare categorical variables for differences between group frequencies. Pearson's correlation coefficient (r) was used to assess the association between GHQ-12 scores and NAQ-R total score. Throughout this paper, data were based on valid responses for each group or subgroup, since not all respondents answered all questions. A p value less than 0.05 was considered statistically significant. Statistical analysis was performed with SPSS 17.0v for Windows (SPSS Inc., Chicago, Ill, USA).

RESULTS

This study is inclusive in nature and provides ground for generalization since it was carried out in seventeen hospitals across country. The total sample was 635 employees (Doctors n=232, Nurses n=403) working in 20 NICUs nationwide. Three hundred and ninety-eight (398) employees responded to the questionnaire (overall response rate 62, 8%). The response rate among the NICUs ranged from 18% to 100%.

Characteristics of the victims of bullying

The mean (SD) age was 43.3 (9.5) years, 163 (41%) were physicians and 235 (59%) nurses. The mean (SD) working hours/week were 47, 9 (13, 2) and most of the respondents had a permanent job contract (72%). Smoking was assessed by means of a question about whether

the respondent was a current smoker (n=88, 22%) or nonsmoker (n=312, 78%). 283 (72, 9%) of the respondents referred to a non-sedentary lifestyle, indicated by physical activity and only 11 (2, 8%) of them to alcohol consumption.

Professional groups of doctors and nurses by demographic data (gender, age, job contract, hours worked/week), health risk behavior (BMI, physical activity, smoking, alcohol consumption) are presented in table 1. Professional job grade for doctors and nurses, educational level and job experience in the field are presented in table 2.

According to data analysis 213 employees (53, 5 %) were estimated as being bullied based on NAQ-R score (≥33)). Demographic data (age, job contract, hours at work/week), health risk behavior (BMI, physical activity, smoking, alcohol), job grade and educational level did not differ significantly among bullied and non-bullied employees. Victims of bullying differed from non –bullied in terms of gender and job experience in the NICU working environment (Table 1, 2).

Prevalence of bullying and witnessed bullying

Based on NAQ-R score the prevalence of bullying was estimated at 53, 5 % (213/398 respondents) with doctors at 53, 1 % (85/160) and nurses at 53, 6 % (125/233) respectively.

Self labeling as a victim of bulling was present for 108 /387 respondents (27, 9%) while 279/387 (72, 1%) did not refer being bullied. Bullying was referred as mainly occasional, with 92, 8% of the bullied staff experiencing at least one negative behavior over the last 6 months, leaving 7, and 2% on a daily or weekly basis.

Doctors self labeled as victims more commonly than nurses (n=53/156, 34% vs. n=52/226, 23%, $x^2(1) = 5.56$, p=0, 02). Additionally, only 92/205 of those who experienced bullying (NAQ≥33), self labeled themselves as victims (sensitivity 44, 9%), leaving 113/205 (55, 1%) not labeling themselves as victims. On the other hand, 166/182 of those who did not experience bullying (NAQ<33) didn't self label themselves as victims (specificity 91, 2%).

Three hundred and twenty-seven (n=325/390, 83, 3%) employees witnessed bullying of others in the previous six months. Doctors witnessed others being bullied (n=137/161, 85, 1%), similar to nurses (*n* =188/229, 82, 1%) (X2 (1) = 0.611, *p* NS).

Prevalence of negative behaviors

The vast majority (92, 8%) had experienced at least one negative behavior occasionally over the last 6 months and 37, 2% experienced at least one negative behavior on a daily or weekly basis. Two-thirds (76.1%) had experienced five or more negative behaviors to some degree over the last 6 months and 8,5% had experienced five or more negative behaviors on a daily or weekly basis.

Differences on the overall NAQ-R mean score were estimated using t-test statistical analysis. Female employees had a NAQ score 37, 07±12, 55 significantly higher than men 31, 44± 10, 45 ($p<0.003$). Job experience was inversely related to bullying, meaning that the lesser time in the job led to more severe behavior. Employees with experience time <5yrs had higher NAQ score than employees of 20+yrs (37, 67±14.2 vs. 32.90 ±9, 48 ($p<0.015$)).).

Finally, overall NAQ score showed a gradual decrease by age from 39, 98±12, 68 at the age of 26-35 yrs to 33, 6±11, 08 at the age of 56+.

Perception of bullying

Employee's perception of bullying by colleagues and parents and those who witnessed bullying of others differed significantly between bullied and non-bullied professional staff (Figure 1). Bullied respondents perceived themselves as victims of bullying by colleagues and parents at a mean (SD) at 30 (6.9) % and 17.8 (18) % significantly higher than non-bullied at 9.44 (15.2) % and 8 (11.4) % respectively ($p<0.001$) (Fig 1a). Bullied respondents who witnessed bullying of others perceived bullying at a mean (SD) 39.67 (26.5) significantly higher than non-bullied respondents who witnessed bulling of others at 17.9 (19.5) % ($p<0.001$). (Fig 1b)

Reporting of bullying, characteristics of the perpetrator and causes of bullying

Data analysis shows that 58, 1% of respondents being bullied. Of those who complained, most frequent actions taken to deal with were personal reprove (49, 1%), management/labor union involvement (19, 3%) and legislation (10, 5%). Reasons for not reporting bullying were personal self-dealing (67, 2%), fear of consequences (19%) and ignoring as a non-important problem (6, 9%). Additionally, 69, 4% (59/85) of respondents referred being bullied in presence of others, 12, 9% (11/85) alone and 17, 6% (15/85) at both conditions.

The respondents reported that when an incident occurred, the perpetrator was most likely to be a supervisor/ senior colleague (40, 7% of those bullied, n=37), followed by peers (26, 4% of those bullied, n=24), a manager (22% of those bullied, n=22) and parents (7, 7%, n=7). In 10, 5% of those bullied, the victim was being bullied by a male person (n=10/95), in 37, 9 % by a female (n=49/95) and in 51, 6% by both (n=36/95). In a 60, 8 % the perpetrator was a male of age 45-64 yrs old, otherwise female of 45 to 54 yrs old in a 63, 5%. It was more than one person behaving disrespectfully for male perpetrators in 46.7 % (14/30) while for female perpetrators 55% (33/60).

Regarding causes of bullying, personality trait (50, 5%), management (32, 2%) and workplace culture (10, 7%) were highlighted as the most important.

Health Impact of bullying

Bullying exposure, witnessed bullying of others and self labeling as a victim, were associated with lower levels of psychological health status. GHQ-12 score was found higher for employees being bullied vs. those who were non-bullied (12,9 ±5,7 vs. 8,5±4,6 respectively, p<0.001), for witnesses bullying vs. those who did not witness bullying of others (11,5 ± 5,5 vs. 7,5±5,7 respectively, p<0,001) and for those who self labeled as victims vs. those who did not self labeled as victims (13,9±6,32 vs. 4,98±9,73 respectively, p<0,001). Additionally, for those who self labeled as victims the more often it was reported (daily 22, 6 ± 7, 82 vs. rarely 13, 01±6, 19, p<0,001) the higher the GHQ-12 score was.

GHQ-12 score was found higher for doctors compared to nurses (11, 58 ± 5, 59 vs. 10, 32±5, 76, p<0.038) and for women health care providers compared to men (11, 13 ± 5, 7 vs. 9, 23 ± 5, 62, p<0,033). GHQ-12 was not associated with any of all other characteristics (job grade, educational level, job contract, hours worked/week, age, BMI, alcohol consumption and smoking).

The overall correlation between NAQ score and GHQ-12 score was found satisfactory (r^2=0,385, p<0.001). The recommended cut-off score of ≥4 indicative of severe psychological distress, ranged from 24, 2 % (37/153) for doctors to 22, 7% (46/212) for nurses.

Bullying and psychological support

The moderator effect that psychological support had on GHQ-12 scale for those employees being bullied or not is shown in Fig 2. Bullied staff with psychological support had a GHQ-12 of 11, 22±6, 34 (while those who were not on psychological support 13, 31±5, 4), that was higher compared to non-bullied employees either they were on psychological support at 9± 3, 53 or not 8, 25±5, 11.

CONCLUSIONS

The main purpose of the current study was to assess prevalence, to examine differences between bullied and non-bullied healthcare staff, to investigate sources, characteristics of perpetrators and barriers to reporting bullying. Finally, to examine the impact on health status and the role that psychological support at work has against bullying. The response rate in the current survey was quite satisfactory. The high response rate reflects the healthcare providers' interest in this topic, since it is the first nationwide survey for bullying in NICUs.

Healthcare profession has one of the highest levels of bullying in the workplace.[37] Prevalence rate of bullying in the current study was found high for doctors and nurses as other studies have shown. [5,8,16] It seems that the highly stressful NICU environment can foster negative

behaviors. The authors believe that interpersonal relations among professional staff members, administrative problems, understaffing, overwork and productivity expectations put pressure on doctors and nurses driving to disruptive, undermining and corrosive behaviors such as bullying. In our study, with the self labeling definition bullying referred at one third of respondents. On the other hand, half of bullied respondents did not self label themselves as victims, possibly due to non-recognition or not-knowing or no-realization of this behavior.[28] As studies have shown if the prevalence of bullying is based on a given definition many victims are either unaware or do not admit being bullied or decline the victim role suggestive of weakness and passivity. [38,39] The rate of witnessing bullying of others was found much higher than Quine and Carter studies, possibly overestimated due to the fact that experiencing bullying is easier to refer than to admit.[2,3,15]

Demographic group differences for victims of bullying were found only for gender and job experience in the field. Higher bullying prevalence among women compared to men, as this study shows, has been referred by many studies, while others didn't report any differences.[7,40-42] Regarding organizational factors we did not find any differences related to job contract, job position and professional group, supportive of findings by Kivimäki et al.[1] The fact that bullying prevalence did not differ for doctors and nurses, job position and educational level at both professional groups, doesn't support a pattern of discrimination as other studies have shown(15)[17]. Workplace bullying is a wide spread complex phenomenon, both in interpersonal and organizational level, not involving certain professional groups[1]. Crude NAQ-R score was found significantly higher according to gender (higher for women), age (younger employees had higher NAQ-R score), job experience in the field (less years of experience with higher NAQ-R score) and witnessing bullying of others (witnessing bulling of others with higher NAQ-R score). This finding supports Rayner et al, and Hoel & Cooper et al studies who noted that younger employees being in a subordinate position are more frequently exposed to bullying behavior. [42,43] On the contrary, Einarsen and Skogstadt found the exactly opposite results with seniors being bullied more often than younger employees.[44]

Bullying in the health sector includes specific interactions among supervisors, healthcare staff, co-workers and visitors (parents/families in the NICU environment. Bullying from colleagues and parents was perceived easier by bullied employee's (recipients) and those who witnessed bullying of others (observers), indicative of a more susceptible (sensitive) approach.[45] Seniors/supervisors, other than colleagues and parents were reported as the most common sources of bullying. Many other studies have shown that bullying is a top-down process with most of the perpetrators being in a superior status confirming that this phenomenon is characterized by imbalance of power.[43] Also, the fact that bullying behavior occurs between peers in working environments (as NICU) requiring teamwork is in line with

Zapf et al study.[46] Although male dominated organizations are associated with high rates of bullying, our study showed that the phenomenon also exists in this highly female dominated environment, with most of perpetrators being women.[5] The fact that perpetrators female and male were mainly 45-64 yrs old signals the need for intervention policies. Furthermore, our study showed that approximately 1 in 2 of male or female perpetrators were more than one person behaving disrespectfully. Nearly 70 percent of respondents referred being bullied in presence of others suggestsing that consequences of bullying take place on an individual but also social-group level.[12] Underreporting bullying associates to understanding the barriers that healthcare professionals arise to report bullying. Reasons for not reporting were mainly personal self dealing and fear for consequences. The last could be attributed to the belief that bullying could have an impact on their professional progress.[47] Anti-bullying policies should decrease barriers to reporting bullying, and increase staff confidence in preventing and dealing with this behavior. Our study sresses out that personality trait of victims, management and workplace culture were considered as the main causes of bullying. Personality trait characterizes people who can be "easy to target" persons, and this supports the widespread concept of "blaming the victim", although most researchers agree that there isn't any characteristic type of personality. [8,48]

In our study respondents being bullied, with self labeling as victims and those who witnessed bullying of others, had higher GHQ-12 scores indicative of mental and general stress. Doctors among other healthcare workers are at increased risk for occupational stress.[49]In our study, irrespective of the fact they had been bullied or not, doctors had higher levels of psychological distress than nurses and females than men. The high GHQ-12 score among doctors reflects the effect of pressurized working conditions, heavy workload and daily crucial decisions about life and death. Weinberg and Creed's study showed that stressful conditions at work contribute to psychological distress, as a result of the vicious cycle that heavy workload creates with anxiety and depression. [27,29] Moreover, a quarter of doctors and nurses reported high GHQ-12 scores indicative of severe psychological distress as other studies have noted.[50] GHQ-12 showed no differences regarding other characteristics (job grade, educational level, job contract, job experience in the field, hours worked /week, BMI, smoking, alcohol consumption) as noted in other studies. [49,51] Correlation of bullying with health status, as high NAQ scores were accompanied by high GHQ-12 scores, shows bullying association with psychological distress. Einarsen et al portray victims of bullying, as persons with low self-confidence, being depressed, anxious, suspicious, uncertain and disappointed.[28] In our study the, the psychological component of bullying was surfaced. Those who had been bullied and were on psychological support had better health status (lower GHQ-12 score) than those who had been bullied and were not on psychological support. On the other hand, the non-bullied and psychologically supported compared to non-bullied and not psychologically supported respondents had worse health status (higher GHQ-12 score). As other studies have shown the association between

GHQ-12 to bullying and psychological support, the last considered as a buffer against psychological distress.[5,8]

Although the study was systematically organized, objectives were met, and findings provided a ground for generalization (especially in a Neonatal context) there are several limitations in two main areas, the instrument used and the respondent's perception of the effects of bullying to their everyday life. Firstly, the questionnaire used in the study does not provide substantial causal evidence (or identification of risk factors) that bullying has on healthcare employees. Furthermore, issues of prevention and mechanisms of controlling and management of bullying in a Neonatal context were not included in the questionnaire. Finally, respondent's perceptions subjectivity to the topic could be a factor that should be examined in further research.

The disturbing extremely high rates of bullying, along with the higher levels of psychosocial stress for those being bullied, reveal the negative effect bullying has on both professional groups of doctors and nurses. A supportive work environment protects staff and moderates any harmful effects from bullying behavior. Management of bullying must be based on freely reporting bullying behaviors and staff should not be reluctant to report bullying, as usually occurs. First priority for doctors and nurses working in the NICU should be team work and cooperation. Considering that the NICU environment is demanding, the working conditions are increasingly pressured, the existing heavy workload and conflicts among staff, more longitudinal studies for disruptive behaviors as bullying are needed.

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Contributors:
IC planned the study, analyzed the results, and drafted the paper; he is also the guarantor. FB and PC planned the study, managed the survey and collected the results. FV commented on the plans and helped with the final draft. GM commented on the plans.

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Table 1: Characteristics of the study participants and exposure to bullying

	n (%)	Bullied (n=213) n (%)	Not Bullied (n=185) n (%)	p
Occupational group (n=398)				
Neonatologists	163 (41)	85 (53,1)	75(46,9)	NS
Nurses	235 (59)	125(53,6)	108(46,4)	
Gender (n=401)				
Male	51 (12,7)	18 (36)	32 (64)	0,009
Female	350 (87,3)	195 (56,4)	151 (43,6)	
Age (n=366)				
26-35	64 (17,1)	40 (62,5)	24(37,5)	NS
36-45	163 (44,4)	86(53,1)	76(46,9)	
46-55	114 (31,1)	55(48,7)	58(51,3)	
56+	25 (6,8)	12(48)	13(52)	
BMI (Kg/m2) (n=383)				
Up to 18,5	13 (3,4)	8 (61,5)	5 (38,5)	NS
18,5-24,9	243 (63,4)	132 (55,2)	107 (44,8)	
25-29,9	92 (24)	45(48,9)	47 (51,1)	
>30	35 (9,1)	17(50)	17(50)	
Physical activity (n=388)				
Yes (Non-Sedentary)	283 (72,9)	152(54,1)	129 (45,9)	NS
No (Sedentary)	105 (27,1)	54(52,4)	49 (47,6)	
Smoker (n=400)				
Yes (Smoker)	88 (22)	45 (51,7)	42(48,3)	NS
No (Non-Smoker)	312 (78)	167(54,2)	141(45,8)	
Alcohol (n=395)				
Yes (High-Low)	11 (2,8)	6 (54,5)	5(45,5)	NS
No (No)	384 (97,2)	203(53,4)	177(46,6)	
Job contract(n=368)				
Permanent	265 (72)	140(53,4)	122(46,6)	NS
Not permanent	95 (25,8)	47(50)	47(50)	
Other	8 (2,2)	5(62,5)	3(37,5)	
Hours of Work (n=374)				
Up to 40	245 (65, 5)	128 (52,9%)	114 (47,1%)	NS
>40	129 (34,5)	73 (57,5%)	54 (42,5%)	

*Multiple responses could not be entered. Not all respondents answered all questions

Table 2: Study participants and exposure to bullying

	n (%)	Bullied n (%)	Not Bullied n (%)	p
Doctors (n=164)				
Registrar	37 (22,6)	22(61,1)	14(38,9)	NS
Senior Registrar	42 (25,6)	19(45,2)	23(54,8)	
Consultant	73 (44,5)	40(56,3)	31(43,7)	
Research Assistant/Fellow	12 (7,3)	5(41,7)	7(58,3)	
Nurses (n=235)				
Nurse	127 (54)	67(53,2)	59(46,4)	NS
Midwife	82 (34,9)	46(56,1)	36(43,9)	
Lead Nurse	15 (6,4)	4(28,6)	10(71,4)	
Head Nurse	11 (4,7)	8(72,7)	3(27,3)	
Educational level (n=393)				
Technological Educational Institute	187 (47,6)	94 (50,8)	91 (49,2)	NS
University	97 (24,7)	56(58,9)	39(41,1)	
Postgraduate	109 (27,7)	59 (54,6)	49(45,4)	
Job experience in the field (n=342)				
<5yrs	79 (23,1)	44(56,4)	34(43,6)	0,048
5-10yrs	56 (16,4)	35(63,6)	20(36,4)	
10.1-20 yrs	117 (34,2)	65(56)	51(44)	
>20yrs	90 (26,3)	37(41,6)	52(58,4)	

*Multiple responses could not be entered. Not all respondents answered all questions

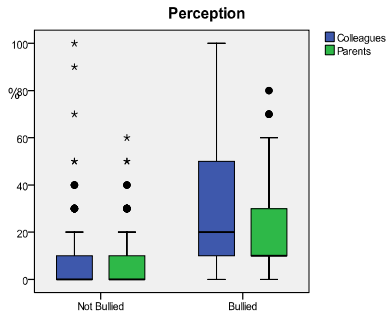

Figure 1a. Perception of bullying by colleagues and parents between bullied and non bullied respondents

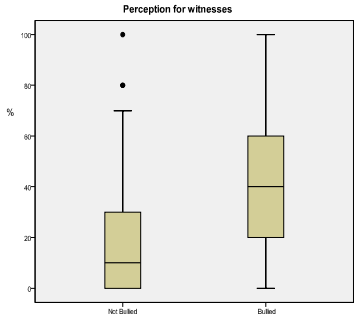

Figure 1b. Perception being a witness of bullying of others between bullied and non-bullied respondents

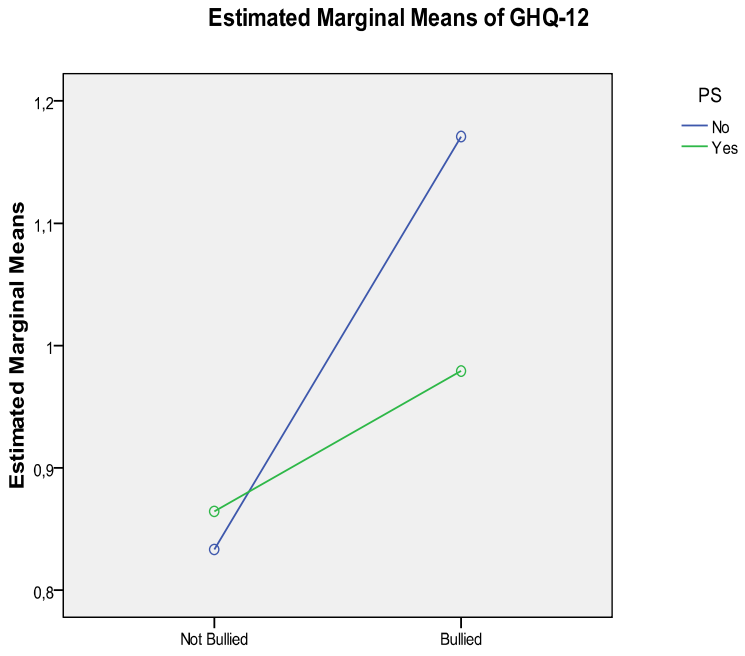

Figure 2. Psychological Support as a buffer against bullying

REFERENCES

1. Kivimaki M, Elovainio M, Vahtera J. Workplace bullying and sickness absence in hospital staff. *Occup Environ Med* 2000;57(10):656–60.
2. Carter M, Thompson N, Crampton P, et al. Workplace bullying in the UK NHS: A questionnaire and interview study on prevalence, impact and barriers to reporting. *BMJ Open* 2013;3(6):e002628.
3. Quine L. Workplace bullying in NHS community trust: staff questionnaire survey. *BMJ* 1999;318(7178):228–32.
4. Murray JS. Workplace bullying in nursing: a problem that can't be ignored. *Medsurg Nurs* 2009;18(5):273–6.
5. Quine L. Workplace bullying in nurses. *J Health Psychol* 2001;6(1):73–84. A
6. Lochhart K. Experience from a Staff Support Service. *J Community Appl Soc Psychol* 1997;7(3):193–8.
7. Vartia M. The sources of bullying-psychological work environment and organizational climate. *Eur J Work Organ Psychol* 1996;5(2):203–14.
8. Ariza-Montes A, Muniz NM, Montero-Simo MJ, et al. Workplace bullying among healthcare workers. *Int J Environ Res Public Health* 2013;10(8):3121–39.
9. de Vliert E, Einarsen S, Nielsen Morten B. Are national levels of employee harassment cultural covariations of climato-economic conditions? *Work Stress* 2013;27(1):106–22.
10. Power JL, Brotheridge CM, Blenkinsopp J, et al. Acceptability of workplace bullying: A comparative study on six continents. *J Bus Res* 2013;66(3):374–80.
11. Nielsen MB, Skogstad A, Matthiesen SB, et al. Prevalence of workplace bullying in Norway: Comparisons across time and estimation methods. *Eur J Work Organ Psychol* 2009;18(1):81–101.
12. Nielsen MB, Hetland J, Matthiesen SB, et al. Longitudinal relationships between workplace bullying and psychological distress. *Scand J Work Environ Heal* 2012;38(1):38–46.
13. Giorgi G, Arenas A, Leon-Perez JM. An Operative Measure of Workplace Bullying: The Negative Acts Questionnaire Across Italian Companies. *Ind Health* 2011;49:686–95.
14. Nielsen MB, Matthiesen SB, Einarsen S. The impact of methodological moderators on prevalence rates of workplace bullying. A meta-analysis. *J Occup Organ Psychol* 2010;83(4):955–79.
15. Quine L. Workplace bullying in junior doctors: questionnaire survey. *BMJ* 2002;324(7342):878–9.

16. Dellasega CA. Bullying among nurses. *Am J Nurs* 2009;109(1):52–8.
17. Frank E, Carrera JS, Stratton T, et al. Experiences of belittlement and harassment and their correlates among medical students in the United States: longitudinal survey. *BMJ* 2006;333(7570):682.
18. Moreno Jiménez B, Rodríguez Muñioz A, Martínez Gamarra M, et al. Assessing workplace bullying: Spanish validation of a reduced version of the Negative Acts Questionnaire. *Span J Psychol* 2007;10(2):449–57.
19. Myhren H, Ekeberg Ø, Stokland O. Job Satisfaction and Burnout among Intensive Care Unit Nurses and Physicians. *Crit Care Res Pract* 2013;2013:786176.
20. Einarsen S, Nielsen MB. Workplace bullying as an antecedent of mental health problems: a five-year prospective and representative study. *Int Arch Occup Environ Health* 2014;88(2):131–42.
21. Vartia MA. Consequences of workplace bullying with respect to the well-being of its targets and the observers of bullying. *Scand J Work Environ Health* 2001;27(1):63–9.
22. Verkuil B, Atasayi S, Molendijk ML. Workplace Bullying and Mental Health: A Meta-Analysis on Cross-Sectional and Longitudinal Data. *PLoS One* 2015;10(8):e0135225.
23. Ortega A, Christensen KB, Hogh A, et al. One-year prospective study on the effect of workplace bullying on long-term sickness absence. *J Nurs Manag* 2011;19(6):752–9.
24. Paice E, Smith D. Bullying of trainee doctors is a patient safety issue. *Clin Teach* 2009;6(1):13–7.
25. Berthelsen M, Skogstad A, Lau B, et al. Do they stay or do they go? *Int J Manpow* 2011;32(2):178–93.
26. Hogh A, Hoel H, Carneiro IG. Bullying and employee turnover among healthcare workers: a three-wave prospective study. *J Nurs Manag* 2011;19(6):742–51.
27. Oates RK, Oates P. Stress and mental health in neonatal intensive care units. *Arch Dis Child Fetal Neonatal Ed* 1995;72(2):F107-10.
28. Einarsen S. The nature, causes and consequences of bullying at work: The Norwegian experience. *Perspect Interdiscip sur le Trav la santé* 2005;(7–3).
29. Weinberg A, Creed F. Stress and psychiatric disorder in healthcare professionals and hospital staff. *Lancet* 2000;355(9203):533–7.
30. Patole S. Bullying in neonatal intensive care units: free for all. *Arch Dis Child - Fetal Neonatal Ed* 2002 Jan 1;86(1):68F–68.
31. Koh TS, Koh THHG. Bullying in hospitals. *Occup Env Med* 2001;58:608–10.
32. Notelaers G, Einarsen S. The world turns at 33 and 45: Defining simple cutoff scores for the Negative Acts Questionnaire–Revised in a representative sample. *Eur J Work Organ Psychol* 2013;22(6):670–82.

33. Eriksen GS, Nygreen I, Webster RF. Bullying Among Hospital Staff: Use of Psychometric Triage to Identify Intervention Priorities. *Psychom Triage Bullying Electron J Appl Psychol* 2011;7(2):26–31.
34. Einarsen S, Hoel H, Notelaers G. Measuring exposure to bullying and harassment at work: Validity, factor structure and psychometric properties of the Negative Acts Questionnaire-Revised. *Work Stress* 2009;23(1):24–44.
35. Goldberg DP, Werneke U, Yalcin I, et al. The stability of the factor structure of the General Health Questionnaire. *Psychol Med* 2000;30:823–9.
36. Lesage F-X, Martens-Resende S, Deschamps F, et al. Validation of the General Health Questionnaire (GHQ-12) adapted to a work-related context. *Open J Prev Med* 2011;1(2):44–8.
37. Zapf D, Einarsen S. Individual antecedents of bullying: Victims and perpetrators. In: Einarsen S, Hoel H, Zapf D, Cooper C, eds. *Bullying and harassment in the workplace: Developments in theory, research, and practice.* Boca Raton, FLl:CRC *Press,* 2011, 177-200.
38. Mikkelsen EG, Einarsen S. Bullying in Danish work-life: Prevalence and health correlates. *Eur J Work Organ Psychol* 2001;10(4):393–413.
39. Einarsen S. Harassment and bullying at work. *Aggress Violent Behav* 2000;5(4):379–401.
40. Salin D. Ways of explaining workplace bullying: A review of enabling, motivating and precipitating structures and processes in the work environment. *Hum Relations* 2003;56(10):1213–32.
41. Cortina LM, Magley VJ, Williams JH, et al. Incivility in the workplace: incidence and impact. *J Occup Health Psychol* 2001;6(1):64–80.
42. Rayner C. The Incidence of Workplace Bullying. *J Community Appl Soc Psychol* 1997;7(3):199–208.
43. Hoel H, Cooper CL, Faragher B. The experience of bullying in Great Britain: The impact of organizational status. *Eur J Work Organ Psychol* 2001;10(4):443–65.
44. Einarsen S, Skogstad A. Bullying at work: Epidemiological findings in public and private organizations. *Eur J Work Organ Psychol* 1996;5(2):185–201.
45. Einarsen S. The nature and causes of bullying at work. *Int J Manpow* 1999;20(1/2):16–27.
46. Zapf D. Organisational, work group related and personal causes of mobbing/bullying at work. *Int J Manpow* 1999;20(1/2):70–85.
47. Pisklakov S, Tilak V, Patel A, et al. Bullying and Aggressive Behavior among Health Care Providers : Literature Review. *Advances in Anthropology* 2013;3(4):179–82.
48. Finne LB, Knardahl S, Lau B. Workplace bullying and mental distress - a prospective

study of Norwegian employees. *Scand J Work Environ Health* 2011;37(4):276–87.

49. Coomber S, Todd C, Park G, et al. Stress in UK intensive care doctors. *Br J Anaesth* 2002;89(6):873–81.

50. Ramirez AJ, Graham J, Richards MA, et al. Mental health of hospital consultants: the effects of stress and satisfaction at work. *Lancet* 1996;347(9003):724–8.

51. Firth-Cozens J, Moss F. Hours, sleep, teamwork, and stress. Sleep and teamwork matter as much as hours in reducing doctors' stress. *BMJ* 1998;317(7169):1335–6.

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Prevalence, causes and mental health impact of workplace bullying in the Neonatal Intensive Care Unit environment

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ABSTRACT

Objectives: The aim of this study is to examine the prevalence, to report barriers and mental health impact of bullying behaviors and to analyze whether psychological support at work could affect victims of bullying in the health care workplace.

Design: Self-administered questionnaire survey.

Setting: 20 in total Neonatal Intensive Care Units in 17 hospitals in Greece.

Participants: 398 healthcare professionals (Doctors, Nurses).

Main outcome measures: The questionnaire included information on demographic data, Negative Act Questionnaire (NAQ-R) behavior scale, data on sources of bullying, perpetrators profile, causal factors, actions taken, and reasons for not reporting bullying, psychological support, and General Health Questionnaire (GHQ-12) scores to investigate psychological distress.

Results: Prevalence of bullying measured by the NAQ-R was 53.1 % for doctors and 53.6% for nurses. Victims of bullying differed from non-bullied in terms of gender and job experience, among demographic data. Crude NAQ-R score was found higher for female, young and inexperienced employees. Of those respondents who experienced bullying 44.9% self labeled themselves as victims. Witnessing bullying of others was found 83.2%. Perpetrators were mainly females 45-64 years old, most likely being a supervisor/senior colleague. Common reasons for not reporting bullying was self-dealing and fear of consequences. Bullying was attributed to personality trait and management. Those who were bullied, self labeled as a victim and witnessed bullying of others had higher GHQ-12 score. Moreover, psychological support at work had a favor effect on victims of bullying.

Conclusions: Prevalence of bullying and witnessing were found extremely high, while half of victims didn't consider themselves as sufferers. The mental health impact on victims and

witnesses was severe and support at work was necessary to ensure good mental health status among employees.

Strengths and limitations of this study

- This is the first study globally aiming to investigate Workplace Bullying in a Neonatal Intensive Care context.
- Workplace Bullying is one of the main problem medical personnel faces in recent years and studying its prevalence and its impact on behaviors is at the top of the research agenda for many academics and practitioners in healthcare worldwide.
- The instrument used in the study does not provide substantial causal evidence or identification of risk factors related to bullying in healthcare employees.
- Issues of prevention and mechanisms of controlling and management of bullying were not included in this study and this is a topic for a next research.

INTRODUCTION

Workplace bullying has long been recognized as a serious, disruptive problem in modern healthcare organizations. [1-4] Bullying aggressive behavior is defined by criteria as: intention to cause harm or distress, imbalance of power between the bully (perpetrator, aggressor) and the victim (target), and repeatability over time. The majority of definitions, centers on the perception of the victim, but differ in terms of duration, frequency and behavioral acts. [2,3] Additionally, bullying is characterized by persistency (in terms of duration and frequency), by the victim's inability to defend himself/herself, and by the negative impact on the victim.[3,5-9] Bullying behavior research is based mainly on two approaches: (a) the self-labeling, by asking the respondents if they perceive themselves as being bullied and (b) the behavioral experience approach, based on valid, well structured, scientifically sound measure scales. Prevalence rates of workplace bullying depend on the methodology, research design and cultural/geographical characteristics.[8,10] Therefore, bullying varies among countries and working sectors; people working in administration and services are bullied more often than those in production, research or education.[7,10-13] Nielsen et al. in their met analytic study, with the self labeled method with and without a given definition of bullying found a prevalence of 11.3 % and 18.1% respectively, while the behavioral approach revealed a rate of 14.8%.[14]

Bullying behavior is particularly high in health care service. Prevalence in the health sector has been reported from 3-8% up to approximately 40%, depending on the definition used. [3,5,15] Reports from NHS trust showed that a 1/3 among staff[3], 44% of nursing staff[16], 37% of doctors in training[15] had experienced bullying, and from US 84% of medical students suffered

from mistreatment during medical school.[17] More recently, surveys conducted between 2005-2011 for NHS staff showed a prevalence of 15-18% that rose to 24% in 2012.[2]

Despite public awareness, government funded research and anti-bullying legislation, bullying still provokes serious problems, sometimes with detrimental effects on both staff's mental health and quality of healthcare in hospitals. Clinical impact of bullying in hospitals can cause psycho somatic symptoms among healthcare professionals; victims of bullying suffer from anxiety, loss of self-control[17], depression, lower self-confidence[17], occupational job stress, job dissatisfaction[18], dissatisfaction with life[17], burnout syndrome[19], musculoskeletal complaints, increased risk for cardiovascular disease, suicide attempts[17] and drug abuse.[20,21] Bullying is considered a long-lasting threat for psychological and healthcare problems as longitudinal designed studies have shown.[12,20,22]

Additionally bullying is associated with increased abseentism[1,23], career damage, poorer job performance, lower productivity resulting in poorer quality of healthcare services and patient care [2,8]; in the health sector, bullied doctors make more often medical errors while bullied nurses may have lower levels of commitment and turnover.[1,24-26] Bullying and related negative acts are reported in many studies of physicians, nurses, medical personnel and staff working in Intensive Care Units. The challenging environment of Neonatal Intensive Care Units (NICUs) exposes medical and nursing staff to stress very often on a daily basis. Competition, conflicting demands of professional and personal life[27], excessive workload, difficult working conditions, pressure for prompt diagnosis and difficult decisions about end-of life care contribute to excessive stress. Bullying adds burden in the NICU's pressurized and stressful environment, and by exposing healthcare staff to more stress increases psychological distress.[28,29] It is therefore suggested that stress by creating a vicious cycle with psychological distress, promotes victimization.[8,14] As most occupational stress models support, stressors in the work environment generate physical, psychological or behavioral changes for employees.

In our knowledge, there is no research evidence on bullying in the NICU environment except a letter by Patole and Koch.[30,31] Given the paucity of research data and the major impact of bullying on staff's mental health and patient care, the current nationwide survey was conducted for workplace bullying in the Greek Neonatal Intensive Care Units.

The objectives of this study were: (1) to assess the prevalence of workplace bullying in the NICU environment and to examine differences between employees; also to assess witnessing of bullying (2) to investigate sources, characteristics of perpetrators and attitudes towards victims, (3) to examine the impact of bullying on healthcare professional's mental health and (4) to analyze whether psychological support at work can protect staff from adverse effects of bullying.

METHODS

Participants

An anonymous paper questionnaire was sent to physicians and nurses to all 635 healthcare professionals in 20 Neonatal Intensive Care Units at 17 hospitals with a prepaid return envelope. Other health care employees were excluded due to inconsistent presence in NICU's everyday life. A covering letter explaining the purpose of the study was also included and they received a reminder after approximately 4 weeks. The questionnaire consisted of four sections:

Questionnaire

Section 1 of the questionnaire collected information about the participant's job professional group, job grade, qualifications/educational level, job contract, job time experience in the field and hours worked /week. Data for gender, age, body mass index (BMI), physical activity, smoking, drinking were also collected.

Section 2 included NAQ-R (Negative Acts Questionnaire-Revised) a bullying inventory. NAQ-R was translated from English into Greek language by team researchers and a bilingual English teacher back translated the instrument. The retranslated English version and the original were discussed to confirm agreement in each item for linguistic equivalence.

NAQ-R provides prevalence data for each of the 22 negative behaviors as well as an overall mean score (for an objective approach of bullying). Respondents were asked to rate how often they experienced each negative behavior from other staff using a five-point frequency scale (1=never, 2=now and then, 3=monthly, 4=weekly, 5= daily). The overall NAQ-R mean score can range from 22 (meaning that the respondent 'never' experienced any of the 22 negative behaviors) to a maximum of 110 (meaning that the respondent experienced all of the 22 negative behaviors on a daily basis).[32] If ≥ 3 items were unanswered, then the NAQ score was considered missing.[33] A NAQ-R ≥ 33 total score was considered indicative of being a victim of bullying behavior.[32] The internal consistency of NAQ-R as measured by Cronbach's alpha was found quite satisfactory at 0.95.

Additionally, for a subjective approach, NAQ-R includes a self labeled definition of bullying (stem question). The definition used was: "bullying is a situation where one or several individuals persistently over a period of time perceive themselves as being the receivers of a series of negative actions, from one or more several persons, in a situation where the target of bullying has difficulty in defending him or herself against these actions. We will not refer as one-off incident as bullying". Respondents were asked to respond on a five-point scale (1=no, 2=yes, but only rarely, 3=yes, now and then, 4=yes, several times per week, 5=yes, almost daily). NAQ-R also examines whether respondents experienced bullying behaviors from peers, senior staff, or managers in the past 6 months.[34]

Section 3 collected data on perpetrators' profile (age, gender, and professional status), causality, actions taken (whether they reported bullying behavior to any authority) and reasons that bullying was not reported.

At section 4 data were reported on mental health impact using General Health Questionnaire and psychological support at work. The 12-item General Health Questionnaire (GHQ-12), an efficient, reliable, and well validated indexed scale, was used to assess psychological distress.[35,36] GHQ data is scored as a 4-Likert scale (from 0 to 3), to measure severity. Results were evaluated at the more conservative cut-off of ≥4 used in healthcare research for psychological impairment.[29] The scale had a satisfactory internal consistency with Cronbach's alpha of 0.90. Support at work was measured as a dichotomous scale with a yes/ no response if the respondents received psychological support or not. The project was approved by participating Hospital's Scientific Committee's for Medical Research Ethics.

Statistical analysis

Frequency analysis for socio-demographic characteristics and item analysis were used to know the internal consistency of NAQ-R and GHQ-12 by calculating Cronbach's alpha coefficient; exploratory analysis (principal component analysis) was carried out to identify factor structure of NAQ-R and GHQ-12. Continuous variables were expressed as mean ± standard deviation (SD). Student t test or Mann-Whitney test was used to compare continuous variables and χ^2 test or Fisher exact test to compare categorical variables for differences between group frequencies. Pearson's correlation coefficient (r) was used to assess the association between GHQ-12 scores and NAQ-R total score. To test for moderators, buffering the individual against bullying we used univariate analysis of variance with the dependent being mental health impact.

Through this paper, data were based on valid responses for each group or subgroup, since not all respondents answered all questions. A p value less than 0.05 was considered statistically significant. Statistical analysis was performed with SPSS 17.0v for Windows (SPSS Inc., Chicago, Ill, USA).

RESULTS

This study is inclusive in nature and provides ground for generalization since it was carried out in seventeen hospitals across country. The total sample was 635 employees (Doctors n=232, Nurses n=403) working in 20 NICUs nationwide. Three hundred and ninety-eight (398) employees responded to the questionnaire (overall response rate 62. 8%). The response rate among the NICUs ranged from 18% to 100%.

Characteristics of the victims of bullying

The mean (SD) age was 43.3 (9.5) years, 163 (41%) were physicians and 235 (59%) nurses. The mean (SD) working hours/week were 47. 9 (13. 2) and most of the respondents had a permanent job contract (72%). Smoking was assessed by means of a question about whether the respondent was a current smoker (n=88. 22%) or nonsmoker (n=312. 78%). 283 (72. 9%) of the respondents referred to a non-sedentary lifestyle, indicated by physical activity and only 11 (2. 8%) of them to alcohol consumption.

Professional groups of doctors and nurses by demographic data (gender, age, job contract, hours worked/week), health risk behavior (BMI, physical activity, smoking, alcohol consumption) are presented in table 1. Professional job grade for doctors and nurses, educational level and job experience in the field are presented in table 2.

According to data analysis 213 employees (53. 5 %) were estimated as being bullied based on NAQ-R score (≥33)). Demographic data (age, job contract, hours at work/week), health risk behavior (BMI, physical activity, smoking, alcohol), job grade and educational level did not differ significantly among bullied and non-bullied employees. Victims of bullying differed from non –bullied in terms of gender and job experience in the NICU working environment (Table 1, 2).

Prevalence of bullying and witnessed bullying

Based on NAQ-R score the prevalence of bullying was estimated at 53. 5 % (213/398 respondents) with doctors at 53. 1 % (85/160) and nurses at 53. 6 % (125/233) respectively.

Self labeling as a victim of bulling was present for 108 /387 respondents (27. 9%) while 279/387 (72. 1%) did not refer being bullied. Bullying was referred as mainly occasional, with 92. 8% of the bullied staff experiencing at least one negative behavior over the last 6 months, leaving 7, and 2% on a daily or weekly basis.

Doctors self labeled as victims more commonly than nurses (n=53/156, 34% vs. n=52/226, 23%, $x^2(1) = 5.56$, p=0. 02). Additionally, only 92/205 of those who experienced bullying (NAQ≥33), self labeled themselves as victims (sensitivity 44. 9%), leaving 113/205 (55. 1%) not labeling themselves as victims. On the other hand, 166/182 of those who did not experience bullying (NAQ<33) didn't self label themselves as victims (specificity 91. 2%).

Three hundred and twenty-seven (n=325/390, 83. 3%) employees witnessed bullying of others in the previous six months. Doctors witnessed others being bullied (n=137/161, 85. 1%), similar to nurses (*n* =188/229, 82. 1%) (X2 (1) = 0.611, *p* NS).

Prevalence of negative behaviors

The vast majority (92. 8%) had experienced at least one negative behavior occasionally over the last 6 months and 37. 2% experienced at least one negative behavior on a daily or weekly basis. Two-thirds (76.1%) had experienced five or more negative behaviors to some degree over the last 6 months and 8.5% had experienced five or more negative behaviors on a daily or weekly basis.

Differences on the overall NAQ-R mean score were estimated using t-test statistical analysis. Female employees had a NAQ score 37. 07±12. 55 significantly higher than men 31. 44± 10. 45 ($p<0.003$). Job experience was inversely related to bullying, meaning that the lesser time in the job led to more severe behavior. Employees with experience time <5yrs had higher NAQ score than employees of 20+yrs (37. 67±14.2 vs. 32.90 ±9. 48 ($p<0.015$)).

Finally, overall NAQ score showed a gradual decrease by age from 39. 98±12. 68 at the age of 26-35 yrs to 33. 6±11. 08 at the age of 56+.

Perception of bullying

Employee's perception of bullying by colleagues and parents and those who witnessed bullying of others differed significantly between bullied and non-bullied professional staff (Figure 1). Bullied respondents perceived themselves as victims of bullying by colleagues and parents at a mean (SD) at 30 (6.9) % and 17.8 (18) % significantly higher than non-bullied at 9.44 (15.2) % and 8 (11.4) % respectively ($p<0.001$) (Fig 1a). Bullied respondents who witnessed bullying of others perceived bullying at a mean (SD) 39.67 (26.5) significantly higher than non-bullied respondents who witnessed bulling of others at 17.9 (19.5) % ($p<0.001$). (Fig 1b)

Reporting of bullying, characteristics of the perpetrator and causes of bullying

Data analysis shows that 58. 1% of respondents being bullied. Of those who complained, most frequent actions taken to deal with were personal reprove (49. 1%), management/labor union involvement (19. 3%) and legislation (10. 5%). Reasons for not reporting bullying were personal self-dealing (67. 2%), fear of consequences (19%) and ignoring as a non-important problem (6. 9%). Additionally, 69. 4% (59/85) of respondents referred being bullied in presence of others, 12. 9% (11/85) alone and 17. 6% (15/85) at both conditions.

The respondents reported that when an incident occurred, the perpetrator was most likely to be a supervisor/ senior colleague (40. 7% of those bullied, n=37), followed by peers (26. 4% of those bullied, n=24), a manager (22% of those bullied, n=22) and parents (7. 7%, n=7). In 10. 5% of those bullied, the victim was being bullied by a male person (n=10/95), in 37. 9 % by a female (n=49/95) and in 51. 6% by both (n=36/95). In a 60. 8 % the perpetrator was a male of age 45-64 yrs old, otherwise female of 45 to 54 yrs old in a 63. 5%. It was more than

one person behaving disrespectfully for male perpetrators in 46.7 % (14/30) while for female perpetrators 55% (33/60).

Regarding causes of bullying, personality trait (50. 5%), management (32. 2%) and workplace culture (10. 7%) were highlighted as the most important.

Mental Health Impact of bullying

Bullying exposure, witnessed bullying of others and self labeling as a victim, were associated with lower levels of psychological health status. GHQ-12 score was found higher for employees being bullied vs. those who were non-bullied (12.9 ±5.7 vs. 8.5±4.6 respectively, $p<0.001$), for witnesses bullying vs. those who did not witness bullying of others (11.5 ± 5.5 vs. 7.5±5.7 respectively, $p<0.001$) and for those who self labeled as victims vs. those who did not self labeled as victims (13.9±6.32 vs. 4.98±9.73 respectively, $p<0.001$). Additionally, for those who self labeled as victims the more often it was reported (daily 22. 6 ± 7. 82 vs. rarely 13. 01±6. 19, $p<0.001$) the higher the GHQ-12 score was.

GHQ-12 score was found higher for doctors compared to nurses (11. 58 ± 5. 59 vs. 10. 32±5. 76, $p<0.038$) and for women health care providers compared to men (11. 13 ± 5. 7 vs. 9. 23 ± 5. 62, $p<0.033$). GHQ-12 was not associated with any of all other characteristics (job grade, educational level, job contract, hours worked/week, age, BMI, alcohol consumption and smoking).

The overall correlation between NAQ score and GHQ-12 score was found satisfactory ($r^2=0.385$, $p<0.001$). The recommended cut-off score of ≥4 indicative of severe psychological distress, ranged from 24. 2 % (37/153) for doctors to 22. 7% (46/212) for nurses.

Bullying and psychological support

The moderator effect that psychological support had on GHQ-12 scale for those employees being bullied or not is shown as an interaction in Fig 2. Bullied staff with psychological support had a GHQ-12 of 11. 22±6. 34 (while those who were not on psychological support 13. 31±5. 4), that was higher compared to non-bullied employees either they were on psychological support at 9± 3. 53 or not 8. 25±5. 11.

CONCLUSIONS

The main purpose of the current study was to assess prevalence, to examine differences between bullied and non-bullied healthcare staff, to investigate sources, characteristics of perpetrators and barriers to reporting bullying. Finally, to examine the impact on mental health status and the role of psychological support at work. The response rate in the current

survey was quite satisfactory. The high response rate reflects the healthcare providers' interest in this topic, since it is the first nationwide survey for bullying in NICUs.

Healthcare professions have one of the highest levels of bullying in the workplace.[37] Prevalence rate of bullying in the current study was found high for doctors and nurses as other studies have shown. [5,8,16] It seems that the highly stressful NICU environment can foster negative behaviors. Interpersonal relations among professional staff members, administrative problems, understaffing, overwork and productivity expectations promote disruptive and corrosive behaviors such as bullying. In our study, with the self labeling definition bullying referred at one third of respondents. On the other hand, half of bullied respondents did not self label themselves as victims, possibly due to non-recognition or not-knowing or no-realization of this behavior.[28] As studies have shown if the prevalence of bullying is based on a given definition, many victims are either unaware or do not admit being bullied or decline the victim role as it suggests weakness and passivity.[38,39] The rate of witnessing bullying of others was found much higher than Quine and Carter studies, possibly due to the fact that experiencing bullying is easier to refer than to admit.[2,3,15]

Demographic group differences for victims of bullying were found only for gender and job experience in the field. Higher bullying prevalence among women compared to men, as this study shows, has been referred by many studies, while others didn't report any differences.[7,40-42]

This lack of consistency could be attributed to discriminations that both genders can suffer or to the broader dysfunctional practices (involving sexual harassment) that bullying actions incorporate.

Regarding organizational factors we did not find any differences related to job contract, job position and professional group, supportive to Kivimäki et al.[1] findings. The fact that bullying prevalence did not differ for doctors and nurses, job position and educational level at both professional groups, doesn't support a pattern of discrimination as other studies have shown[15,17]. Workplace bullying is a wide spread complex phenomenon, both in interpersonal and organizational level, not involving certain professional groups[1]. Crude NAQ-R score was found significantly higher according to gender (higher for women), age (higher for younger employees), job experience in the field (higher for less years of experience) and witnessing bullying of others. This finding supports Rayner et al, and Hoel & Cooper et al studies who noted that younger employees being in a subordinate position are more frequently exposed to bullying behavior. [42,43] On the contrary, Einarsen and Skogstadt found the exactly opposite results with seniors being bullied more often than younger employees.[44]

Bullying in the health sector includes specific interactions among supervisors, healthcare staff, co-workers and visitors (parents/families) in the NICU environment. Bullying from colleagues and parents was perceived easier by bullied employee's (recipients) and those who witnessed bullying of others (observers), indicative of a more susceptible approach by them.[45] Seniors/supervisors, other than colleagues and parents were reported as the most common sources of bullying[17]. Many other studies have shown that bullying is a top-down process with most of the perpetrators being in a superior status supportive of imbalance of power.[17,43] Also, the fact that bullying behavior occurs between peers in team working environments (as NICU) is in line with Zapf et al study.[46] Although male dominated organizations are associated with high rates of bullying, our study showed that it also exists in a highly female dominated environment.[5] The fact that perpetrators female and male were mainly 45-64 yrs old signals the need for intervention policies. Furthermore, our study showed that half of male or female perpetrators were more than one person. Nearly 70 percent of respondents referred being bullied in presence of others suggesting that bullying takes place both on an individual and social-group level.[12] Underreporting bullying associates to understanding the barriers that healthcare professionals arise to report bullying. Reasons for not reporting were mainly personal self dealing and fear for consequences. The last could be attributed to the belief that bullying may have an impact on their professional progress.[47] Anti-bullying policies should decrease barriers to reporting bullying, and increase staff confidence in preventing and dealing with this behavior. Our study sresses out that personality trait of victims, management and workplace culture were considered as the main causes of bullying. Personality trait characterizes people who can be "easy to target" persons, supporting the widespread concept of "blaming the victim". [8,48]

In our study respondents being bullied, those self labeling themselves as victims and witnessed bullying of others, had higher GHQ-12 scores indicative of psychological stress. Doctors among other healthcare workers are at increased risk for occupational stress.[49] In our study, either they had been bullied or not, doctors had higher levels of psychological distress than nurses and females than men. The high GHQ-12 score among doctors reflects the effect of pressurized working conditions, heavy workload and daily crucial decisions about life and death. Weinberg and Creed's study showed that stressful conditions at work contribute to psychological distress, as a result of the vicious cycle that heavy workload creates with anxiety and depression.[27,29] Moreover, a quarter of doctors and nurses reported high GHQ-12 scores indicative of severe psychological distress as other studies have noted.[50] GHQ-12 showed no differences regarding other characteristics (job grade, educational level, job contract, job experience in the field, hours worked /week, BMI, smoking, alcohol consumption) as noted in other studies. [49,51] Correlation of bullying with mental health status, as high NAQ scores were accompanied by high GHQ-12 scores, shows bullying association with psychological distress. Einarsen et al portray victims of bullying, as persons with low

self-confidence, being depressed, anxious, suspicious, uncertain and disappointed.[28] In our study the psychological component of bullying was surfaced. Those who had been bullied and were on psychological support had better mental health status (lower GHQ-12 score) than those who had been bullied and were not on psychological support. On the other hand, the non-bullied and psychologically supported compared to non-bullied and not psychologically supported respondents had worse mental health status (higher GHQ-12 score). As other studies have shown an association between mental health status bullying and psychological support exist, with the last considered as a buffer against bullying.[5,8] Moreover, a supportive work environment and factors such as job control and personal self-regulation can play a protective role (act as buffers) against bullying negative acts.[3,52,53] The authors strongly believe that changes in the work design (emphasis on teamwork, delegation and autonomy) and implementation of organization-wide HR initiatives such as awareness building, education and counseling can provide psychological assistance and act as barriers to bullying in the NICU environment.[54,55] Although the study was systematically organized, objectives were met, and findings provided a ground for generalization (especially in a Neonatal context) there are several limitations. Firstly, the questionnaire used in the study does not provide substantial causal evidence (or identification of risk factors) that bullying has on healthcare employees. Furthermore, issues of prevention and mechanisms of controlling and management of bullying in a Neonatal context were not included in the questionnaire. Finally, respondent's perceptions subjectivity to the topic should be examined in further research.

The disturbing extremely high rates of bullying, along with the higher levels of psychological stress for those being bullied, reveal the negative effects of bullying on both professional groups of doctors and nurses. A supportive work environment protects staff and moderates any harmful effects from bullying behavior. Management of bullying must be based on freely reporting bullying behaviors and staff should not be reluctant to report bullying. First priority for doctors and nurses working in the NICU should be team work and cooperation. More studies for disruptive behaviors such as bullying are needed, considering the demanding NICU environment, the pressured working conditions, the existing heavy workload and conflicts among staff.

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Contributors:
IC planned the study, analyzed the results, and drafted the paper; he is also the guarantor. FB and PC planned the study, managed the survey and collected the results. FV commented on the plans and helped with the final draft. GM commented on the plans.

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Table 1: Characteristics of the study participants and exposure to bullying

	n (%)	Bullied n (%)	Not Bullied n (%)	p
Occupational group (n=398)				
Neonatologists	160 (40.7)	85 (53.1)	75(46.9)	NS
Nurses	233 (59.3)	125(53.6)	108(46.4)	
Gender (n=401)				
Male	50 (12.6)	18 (36)	32 (64)	0.009
Female	346 (87.4)	195 (56.4)	151 (43.6)	
Age (n=366)				
26-35	64 (17.6)	40 (62.5)	24(37.5)	NS
36-45	162 (44.5)	86(53.1)	76(46.9)	
46-55	113 (31)	55(48.7)	58(51.3)	
56+	25 (6.9)	12(48)	13(52)	
BMI (Kg/m2) (n=383)				
Up to 18.5	13 (3.4)	8 (61.5)	5 (38.5)	NS
18.5-24.9	239 (63.2)	132 (55.2)	107 (44.8)	
25-29.9	92 (24.4)	45(48.9)	47 (51.1)	
>30	34 (9.)	17(50)	17(50)	
Physical activity (n=388)				
Yes (Non-Sedentary)	281 (73.2)	152(54.1)	129 (45.9)	NS
No (Sedentary)	103 (26.8)	54(52.4)	49 (47.6)	
Smoker (n=400)				
Yes (Smoker)	87 (22)	45 (51.7)	42(48.3)	NS
No (Non-Smoker)	308 (78)	167(54.2)	141(45.8)	
Alcohol (n=395)				
Yes (High-Low)	11 (2.8)	6 (54.5)	5(45.5)	NS
No (No)	380 (97.2)	203(53.4)	177(46.6)	
Job contract(n=368)				
Permanent	262 (72)	140(53.4)	122(46.6)	NS
Not permanent	94 (25.8)	47(50)	47(50)	
Other	8 (2.2)	5(62.5)	3(37.5)	
Hours of Work (n=374)				
Up to 40	242 (65.6)	128 (52.9)	114 (47.1)	NS
>40	127 (34.4)	73 (57.5)	54 (42.5)	

*Multiple responses could not be entered. Not all respondents answered all questions of NAQ score

Table 2: Study participants and exposure to bullying

	n (%)	Bullied n (%)	Not Bullied n (%)	p
Doctors (n=164)				
Registrar	36 (22.4)	22(61.1)	14(38.9)	NS
Senior Registrar	42 (26.1)	19(45.2)	23(54.8)	
Consultant	71 (44)	40(56.3)	31(43.7)	
Research Assistant/Fellow	12 (7.5)	5(41.7)	7(58.3)	
Nurses (n=235)				
Nurse	126 (54)	67(53.2)	59(46.4)	NS
Midwife	82 (35.2)	46(56.1)	36(43.9)	
Lead Nurse	14 (6)	4(28.6)	10(71.4)	
Head Nurse	11 (4.8)	8(72.7)	3(27.3)	
Educational level (n=393)				
Technological Educational Institute	185 (47.7)	94 (50.8)	91 (49.2)	NS
University	95 (24.5)	56(58.9)	39(41.1)	
Postgraduate	108 (27.8)	59 (54.6)	49(45.4)	
Job experience in the field (n=342)				
<5yrs	78 (23.1)	44(56.4)	34(43.6)	0.048
5-10yrs	55 (16.3)	35(63.6)	20(36.4)	
10.1-20 yrs	116 (34.3)	65(56)	51(44)	
>20yrs	89 (26.3)	37(41.6)	52(58.4)	

*Multiple responses could not be entered. Not all respondents answered all questions

REFERENCES

1. Kivimaki M, Elovainio M, Vahtera J. Workplace bullying and sickness absence in hospital staff. *Occup Environ Med* 2000;57(10):656–60.
2. Carter M, Thompson N, Crampton P, et al. Workplace bullying in the UK NHS: A questionnaire and interview study on prevalence, impact and barriers to reporting. *BMJ Open* 2013;3(6):e002628.
3. Quine L. Workplace bullying in NHS community trust: staff questionnaire survey. *BMJ* 1999;318(7178):228–32.
4. Murray JS. Workplace bullying in nursing: a problem that can't be ignored. *Medsurg Nurs* 2009;18(5):273–6.
5. Quine L. Workplace bullying in nurses. *J Health Psychol* 2001;6(1):73–84. A
6. Lochhart K. Experience from a Staff Support Service. *J Community Appl Soc Psychol* 1997;7(3):193–8.
7. Vartia M. The sources of bullying-psychological work environment and organizational climate. *Eur J Work Organ Psychol* 1996;5(2):203–14.
8. Ariza-Montes A, Muniz NM, Montero-Simo MJ, et al. Workplace bullying among healthcare workers. *Int J Environ Res Public Health* 2013;10(8):3121–39.
9. de Vliert E, Einarsen S, Nielsen Morten B. Are national levels of employee harassment cultural covariations of climato-economic conditions? *Work Stress* 2013;27(1):106–22.
10. Power JL, Brotheridge CM, Blenkinsopp J, et al. Acceptability of workplace bullying: A comparative study on six continents. *J Bus Res* 2013;66(3):374–80.
11. Nielsen MB, Skogstad A, Matthiesen SB, et al. Prevalence of workplace bullying in Norway: Comparisons across time and estimation methods. *Eur J Work Organ Psychol* 2009;18(1):81–101.
12. Nielsen MB, Hetland J, Matthiesen SB, et al. Longitudinal relationships between workplace bullying and psychological distress. *Scand J Work Environ Heal* 2012;38(1):38–46.
13. Giorgi G, Arenas A, Leon-Perez JM. An Operative Measure of Workplace Bullying: The Negative Acts Questionnaire Across Italian Companies. *Ind Health* 2011;49:686–95.
14. Nielsen MB, Matthiesen SB, Einarsen S. The impact of methodological moderators on prevalence rates of workplace bullying. A meta-analysis. *J Occup Organ Psychol* 2010;83(4):955–79.
15. Quine L. Workplace bullying in junior doctors: questionnaire survey. *BMJ* 2002;324(7342):878–9.

16. Dellasega CA. Bullying among nurses. *Am J Nurs* 2009;109(1):52–8.
17. Frank E, Carrera JS, Stratton T, et al. Experiences of belittlement and harassment and their correlates among medical students in the United States: longitudinal survey. *BMJ* 2006;333(7570):682.
18. Moreno Jiménez B, Rodríguez Muñioz A, Martínez Gamarra M, et al. Assessing workplace bullying: Spanish validation of a reduced version of the Negative Acts Questionnaire. *Span J Psychol* 2007;10(2):449–57.
19. Myhren H, Ekeberg Ø, Stokland O. Job Satisfaction and Burnout among Intensive Care Unit Nurses and Physicians. *Crit Care Res Pract* 2013;2013:786176.
20. Einarsen S, Nielsen MB. Workplace bullying as an antecedent of mental health problems: a five-year prospective and representative study. *Int Arch Occup Environ Health* 2014;88(2):131–42.
21. Vartia MA. Consequences of workplace bullying with respect to the well-being of its targets and the observers of bullying. *Scand J Work Environ Health* 2001;27(1):63–9.
22. Verkuil B, Atasayi S, Molendijk ML. Workplace Bullying and Mental Health: A Meta-Analysis on Cross-Sectional and Longitudinal Data. *PLoS One* 2015;10(8):e0135225.
23. Ortega A, Christensen KB, Hogh A, et al. One-year prospective study on the effect of workplace bullying on long-term sickness absence. *J Nurs Manag* 2011;19(6):752–9.
24. Paice E, Smith D. Bullying of trainee doctors is a patient safety issue. *Clin Teach* 2009;6(1):13–7.
25. Berthelsen M, Skogstad A, Lau B, et al. Do they stay or do they go? *Int J Manpow* 2011;32(2):178–93.
26. Hogh A, Hoel H, Carneiro IG. Bullying and employee turnover among healthcare workers: a three-wave prospective study. *J Nurs Manag* 2011;19(6):742–51.
27. Oates RK, Oates P. Stress and mental health in neonatal intensive care units. *Arch Dis Child Fetal Neonatal Ed* 1995;72(2):F107-10.
28. Einarsen S. The nature, causes and consequences of bullying at work: The Norwegian experience. *Perspect Interdiscip sur le Trav la santé* 2005;(7–3).
29. Weinberg A, Creed F. Stress and psychiatric disorder in healthcare professionals and hospital staff. *Lancet* 2000;355(9203):533–7.
30. Patole S. Bullying in neonatal intensive care units: free for all. *Arch Dis Child - Fetal Neonatal Ed* 2002 Jan 1;86(1):68F–68.
31. Koh TS, Koh THHG. Bullying in hospitals. *Occup Env Med* 2001;58:608–10.
32. Notelaers G, Einarsen S. The world turns at 33 and 45: Defining simple cutoff scores for the Negative Acts Questionnaire–Revised in a representative sample. *Eur J Work Organ Psychol* 2013;22(6):670–82.

33. Eriksen GS, Nygreen I, Webster RF. Bullying Among Hospital Staff: Use of Psychometric Triage to Identify Intervention Priorities. *Psychom Triage Bullying Electron J Appl Psychol* 2011;7(2):26–31.
34. Einarsen S, Hoel H, Notelaers G. Measuring exposure to bullying and harassment at work: Validity, factor structure and psychometric properties of the Negative Acts Questionnaire-Revised. *Work Stress* 2009;23(1):24–44.
35. Goldberg DP, Werneke U, Yalcin I, et al. The stability of the factor structure of the General Health Questionnaire. *Psychol Med* 2000;30:823–9.
36. Lesage F-X, Martens-Resende S, Deschamps F, et al. Validation of the General Health Questionnaire (GHQ-12) adapted to a work-related context. *Open J Prev Med* 2011;1(2):44–8.
37. Zapf D, Einarsen S. Individual antecedents of bullying: Victims and perpetrators. In: Einarsen S, Hoel H, Zapf D, Cooper C, eds. *Bullying and harassment in the workplace: Developments in theory, research, and practice.* Boca Raton, FLl:CRC *Press,* 2011, 177-200.
38. Mikkelsen EG, Einarsen S. Bullying in Danish work-life: Prevalence and health correlates. *Eur J Work Organ Psychol* 2001;10(4):393–413.
39. Einarsen S. Harassment and bullying at work. *Aggress Violent Behav* 2000;5(4):379–401.
40. Salin D. Ways of explaining workplace bullying: A review of enabling, motivating and precipitating structures and processes in the work environment. *Hum Relations* 2003;56(10):1213–32.
41. Cortina LM, Magley VJ, Williams JH, et al. Incivility in the workplace: incidence and impact. *J Occup Health Psychol* 2001;6(1):64–80.
42. Rayner C. The Incidence of Workplace Bullying. *J Community Appl Soc Psychol* 1997;7(3):199–208.
43. Hoel H, Cooper CL, Faragher B. The experience of bullying in Great Britain: The impact of organizational status. *Eur J Work Organ Psychol* 2001;10(4):443–65.
44. Einarsen S, Skogstad A. Bullying at work: Epidemiological findings in public and private organizations. *Eur J Work Organ Psychol* 1996;5(2):185–201.
45. Einarsen S. The nature and causes of bullying at work. *Int J Manpow* 1999;20(1/2):16–27.
46. Zapf D. Organisational, work group related and personal causes of mobbing/bullying at work. *Int J Manpow* 1999;20(1/2):70–85.
47. Pisklakov S, Tilak V, Patel A, et al. Bullying and Aggressive Behavior among Health Care Providers : Literature Review. *Advances in Anthropology* 2013;3(4):179–82.
48. Finne LB, Knardahl S, Lau B. Workplace bullying and mental distress - a prospective

study of Norwegian employees. *Scand J Work Environ Health* 2011;37(4):276–87.

49. Coomber S, Todd C, Park G, et al. Stress in UK intensive care doctors. *Br J Anaesth* 2002;89(6):873–81.

50. Ramirez AJ, Graham J, Richards MA, et al. Mental health of hospital consultants: the effects of stress and satisfaction at work. *Lancet* 1996;347(9003):724–8.

51. Firth-Cozens J, Moss F. Hours, sleep, teamwork, and stress. Sleep and teamwork matter as much as hours in reducing doctors' stress. *BMJ* 1998;317(7169):1335–6.

52. Hauge LJ, Skogstad A, Einarsen S. The relative impact of workplace bullying as a social stressor at work. *Scand J Psychol* 2010;51(5):426–33.

53. Davidson LM, Demaray MK. Social support as a moderator between victimization and internalizing-externalizing distress from bullying. *Sch Psychol Rev* 2007;36:383–405.

54. Baillien E, De Witte H. The relationship between the occurrence of conflicts in the work unit, the conflict management styles in the work unit and workplace bullying. *Psychol Belg*. 2009;49:207–26.

55. Woodrow C, Guest DE. When good HR gets bad results: exploring the challenge of HR implementation in the case of workplace bullying. *Hum Resour Manag J* 2014;24(1):38–56.

Figure 1a. Perception of bullying by colleagues and parents between bullied and non bullied respondents

Figure 1b. Perception being a witness of bullying of others between bullied and non-bullied respondents

Figure 2. Psychological Support as a buffer against bullying

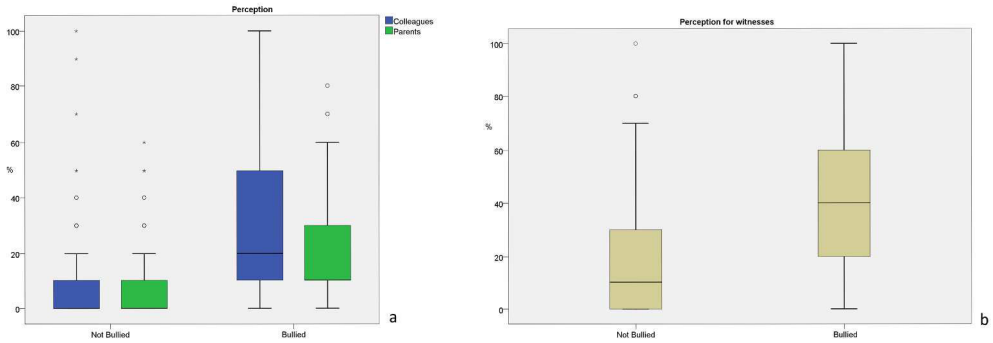

Figure 1a. Perception of bullying by colleagues and parents between bullied and non bullied respondents
Figure 1b. Perception being a witness of bullying of others between bullied and non-bullied respondents

309x112mm (300 x 300 DPI)

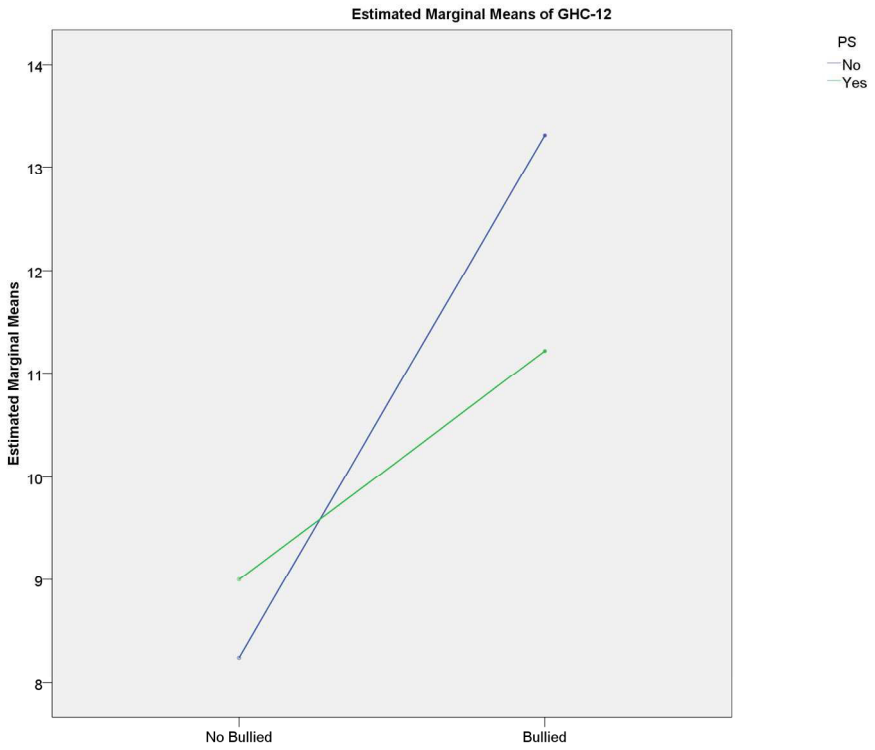

Figure 2. Psychological Support as a buffer against bullying

169x135mm (300 x 300 DPI)

STROBE Statement—checklist of items that should be included in reports of observational studies

	Item No	Recommendation	
Title and abstract	1	(*a*) Indicate the study's design with a commonly used term in the title or the abstract	Self-administered questionnaire survey. (PAGE 1)
		(*b*) Provide in the abstract an informative and balanced summary of what was done and what was found	This study examined the prevalence, barriers and mental health impact of bullying behaviors and also analyzed whether psychological support at work affects victims of bullying in the health care workplace. We found that prevalence of bullying and witnessing were extremely high, while half of victims didn't consider themselves as sufferers. The mental health impact on victims and witnesses was found severe and psychological support at work as necessary to ensure good mental health status. (PAGE 1 AND 2)
Introduction			
Background/rationale	2	Explain the scientific background and rationale for the investigation being reported	Workplace Bullying is one of the main problem medical personnel faces in recent years. Bullying behavior is particularly high in health care service and studying its prevalence and its impact on behaviors is at the top of the research agenda. Given the paucity of research data and the major impact of bullying on staff's mental health and patient care, the current nationwide survey was conducted in the Greek Neonatal Intensive Care Units.(PAGE 2)
Objectives	3	State specific objectives, including any prespecified hypotheses	**The objectives of the study were: to assess the prevalence of workplace bullying, to examine differences between employees, to assess witnessing of bullying; to investigate sources, characteristics of perpetrators and attitudes towards victims. Also to examine the impact of bullying on healthcare professional's mental health and to analyze whether psychological support at work can protect staff from adverse effects of bullying. (PAGE 3)** NICU's workplace is a stressful environment, and exposes healthcare staff to more stress increasing psychological distress. It was suggested that stress by creating a vicious cycle with psychological distress, promotes victimization.(PAGE 3)
Methods			
Study design	4	Present key elements of study design early in the paper	Self-administered anonymous questionnaire survey. (PAGE 4)
Setting	5	Describe the setting, locations, and relevant dates, including periods of recruitment, exposure,	20 in total Neonatal Intensive Care Units in 17 hospitals in Greece. A covering letter explaining the purpose of the study was also included and they received a reminder

		follow-up, and data collection	after approximately 4 weeks.(PAGE 4)
Participants	6	(*a*) *Cohort study*—Give the eligibility criteria, and the sources and methods of selection of participants. Describe methods of follow-up *Case-control study*—Give the eligibility criteria, and the sources and methods of case ascertainment and control selection. Give the rationale for the choice of cases and controls *Cross-sectional study*—Give the eligibility criteria, and the sources and methods of selection of participants	Cross-sectional study- questionnaire was sent to 635 healthcare professionals (physicians and nurses) in 20 Neonatal Intensive Care Units at 17 hospitals across Greece. (PAGE 4)
		(*b*) *Cohort study*—For matched studies, give matching criteria and number of exposed and unexposed *Case-control study*—For matched studies, give matching criteria and the number of controls per case	
Variables	7	Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers. Give diagnostic criteria, if applicable	The study collected data about the participant's job professional group, job grade, qualifications/educational level, job contract, job time experience in the field and hours worked /week, gender, age, BMI, physical activity, smoking, drinking. NAQ-R score provided data for negative behaviors, a total score ≥33 was considered indicative of being a victim of bullying exposure. Data on perpetrators' profile (age, gender, and professional status), causality, actions taken (whether they reported bullying behavior to any authority) and reasons that bullying was not reported were also collected. General Health Questionnaire (GHQ-12) measures psychological distress. Finally psychological support at work was also reported as a modifier.(PAGE 4 and 5)
Data sources/ measurement	8*	For each variable of interest, give sources of data and details of methods of assessment (measurement). Describe comparability of assessment methods if there is more than one group	398 healthcare professionals (Doctors, Nurses) in 17 hospitals in 20 Neonatal Intensive Care Units across Greece.(PAGE 4)
Bias	9	Describe any efforts to address potential sources of bias	Our questionnaire was well structured including NAQ-R and GHQ-12 scores. The questionnairies data twere

			accurate and in detail written as they were answered by healthcare professionals. (PAGE 4)
Study size	10	Explain how the study size was arrived at	The paper questionnaire was sent to physicians and nurses in 20 Neonatal Intensive Care Units at 17 hospitals with a prepaid return envelope. (PAGE 4)
Quantitative variables	11	Explain how quantitative variables were handled in the analyses. If applicable, describe which groupings were chosen and why	Internal consistency of NAQ-R and GHQ-12 by calculating Cronbach's alpha coefficient; (PAGE 5)
Statistical methods	12	(*a*) Describe all statistical methods, including those used to control for confounding	Frequency analysis for socio-demographic characteristics. Continuous variables were expressed as mean ± standard deviation (SD). Student t test or Mann-Whitney test was used to compare continuous variables and χ^2 test or Fisher exact test to compare categorical variables for differences between group frequencies. (PAGE 5)
		(*b*) Describe any methods used to examine subgroups and interactions	Pearson's correlation coefficient (r) was used to assess the association between GHQ-12 scores and NAQ-R total score. To test for moderators, buffering the individual against bullying we used univariate analysis of variance with the dependent being mental health impact. (PAGE 5)
		(*c*) Explain how missing data were addressed	If ≥ 3 items were unanswered, then the NAQ score was considered missing. (PAGE 4)
		(*d*) *Cohort study*—If applicable, explain how loss to follow-up was addressed *Case-control study*—If applicable, explain how matching of cases and controls was addressed *Cross-sectional study*—If applicable, describe analytical methods taking account of sampling strategy	
		(*e*) Describe any sensitivity analyses	

Continued on next page

Results			
Participants	13*	(a) Report numbers of individuals at each stage of study—eg numbers potentially eligible, examined for eligibility, confirmed eligible, included in the study, completing follow-up, and analysed	398 healthcare professionals (Doctors, Nurses) (PAGE 5)
		(b) Give reasons for non-participation at each stage	Three hundred and ninety-eight (398) employees responded to the questionnaire (overall response rate 62, 8%). The response rate among the NICUs ranged from 18% to 100%. (PAGE 5)
		(c) Consider use of a flow diagram	
Descriptive data	14*	(a) Give characteristics of study participants (eg demographic, clinical, social) and information on exposures and potential confounders	The mean (SD) age was 43.3 (9.5) years, 163 (41%) were physicians and 235 (59%) nurses. The mean (SD) working hours/week were 47. 9 (13. 2) and most of the respondents had a permanent job contract (72%). Smoking was assessed by means of a question about whether the respondent was a current smoker (n=88. 22%) or nonsmoker (n=312. 78%). 283 (72. 9%) of the respondents referred to a non-sedentary lifestyle, indicated by physical activity and only 11 (2. 8%) of them to alcohol consumption. Professional groups of doctors and nurses by demographic data (gender, age, job contract, hours worked/week), health risk behavior (BMI, physical activity, smoking, alcohol consumption) are presented in table 1. Professional job grade for doctors and nurses, educational level and job experience in the field are presented in table 2. (PAGE 6)
		(b) Indicate number of participants with missing data for each variable of interest	The total sample was 635 employees (Doctors n=232, Nurses n=403) working in 20 NICUs nationwide. Three hundred and ninety-eight **(398)** employees responded to the questionnaire (overall response rate 62, 8%). Table 1 &2 Neonatologists +Nurses 5 Gender 2 Age 34 BMI 20 Smoker 3 Alcohol 7 Job contract 34 Hours at work 29 Doctors position & Nurses position 4 Educational level 10 Job experience in the field 60 [If ≥ 3 items were unanswered, then the NAQ score was considered missing] (PAGE 13 AND 15)

		(c) *Cohort study*—Summarise follow-up time (eg, average and total amount)	
Outcome data	15*	*Cohort study*—Report numbers of outcome events or summary measures over time	
		Case-control study—Report numbers in each exposure category, or summary measures of exposure	
		Cross-sectional study—Report numbers of outcome events or summary measures	
Main results	16	(*a*) Give unadjusted estimates and, if applicable, confounder-adjusted estimates and their precision (eg, 95% confidence interval). Make clear which confounders were adjusted for and why they were included	No confounder- adjustments were made.
		(*b*) Report category boundaries when continuous variables were categorized	Category boundaries for continous variables were for age (26-35 yrs , 36-45, 46-55, 56+), for BMI (Up to 18.5, 18.5-24.9 , 25-29.9, >30) , Hours at Work (Up to 40, >40), Job experience in field (<5yrs, 5-10 yrs, 10.1-20 yrs, >20yrs) (PAGE 13 AND 15)
		(*c*) If relevant, consider translating estimates of relative risk into absolute risk for a meaningful time period	
Other analyses	17	Report other analyses done—eg analyses of subgroups and interactions, and sensitivity analyses	Pearson's correlation coefficient (r) was used to assess the association between GHQ-12 scores and NAQ-R total score. To test for moderators, buffering the individual against bullying we used univariate analysis of variance with the dependent being mental health impact.(PAGE 5)
Discussion			
Key results	18	Summarise key results with reference to study objectives	**The objectives of the study were: to assess the prevalence of workplace bullying, to assess witnessing of bullying;** • Prevalence rate of bullying was found high for doctors and nurses. With the self labeling definition bullying referred at one third of respondents. Half of bullied respondents did not self label themselves as victims. • The rate of witnessing bullying of others was found extremely high. (PAGE 9)

			to examine differences between employees, ….. • Demographic group differences for victims of bullying were found only for gender and job experience in the field. • Regarding organizational factors we did not find any differences related to job contract, job position and professional group. • Crude NAQ-R score was found significantly higher according to gender (higher for women), age (higher for younger employees), job experience in the field (higher for less years of experience) and witnessing bullying of others. (PAGE 9) **to investigate sources, characteristics of perpetrators and attitudes towards victims. …..** • Bullying from colleagues and parents was perceived easier by bullied employee's (recipients) and those who witnessed bullying of others (observers). • Seniors/supervisors, other than colleagues and parents were reported as the most common sources of bullying. We found that perpetrators were female and male mainly at the age of 45-64 yrs old. Furthermore, half of male or female perpetrators were more than one person and nearly 70 percent of respondents referred being bullied in presence of others. • Reasons for not reporting were mainly personal self dealing and fear for consequences. (PAGE 10) **Also to examine the impact of bullying on healthcare professional's mental health …….** • In our study respondents being bullied, those self labeling themselves as victims and witnessed bullying of others, had higher GHQ-12 scores indicative of psychological stress. • Either they had been bullied or not, doctors had higher levels of psychological distress than nurses and females than men. Moreover, a quarter of doctors and nurses reported high GHQ-12 score indicative of psychological distress. • GHQ-12 showed no differences regarding other characteristics (job grade, educational level, job contract, job experience in the field, hours worked /week, BMI, smoking, alcohol consumption).

			• High NAQ score was associated with high high GHQ-12 scores, showing bullying association with psychological distress. (PAGE 10) **and to analyze whether psychological support at work can protect staff from adverse effects of bullying. ……** • Regarding psychological support as a buffer against bullying, those who had been bullied and were on psychological support had better mental health status (lower GHQ-12 score) than those who had been bullied and were not on psychological support. On the other hand, the non-bullied and psychologically supported compared to non-bullied and not psychologically supported respondents had worse mental health status (higher GHQ-12 score). (PAGE 11)
Limitations	19	Discuss limitations of the study, taking into account sources of potential bias or imprecision. Discuss both direction and magnitude of any potential bias	Although the study was systematically organized, objectives were met, and findings provided a ground for generalization (especially in a Neonatal context) there are several limitations. Firstly, the questionnaire used in the study does not provide substantial causal evidence (or identification of risk factors) that bullying has on healthcare employees. Furthermore, issues of prevention and mechanisms of controlling and management of bullying in a Neonatal context were not included in the questionnaire. Finally, respondent's perceptions subjectivity to the topic should be examined in further research. (PAGE 11)
Interpretation	20	Give a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies, and other relevant evidence	The high response rate reflects the healthcare providers' interest in this topic, since it is the first nationwide survey for bullying in NICUs. Healthcare professions have one of the highest levels of bullying in the workplace.[37] • Prevalence rate of bullying in the current study was found high for doctors and nurses as other studies have shown.[5,8,16] **It seems that the highly stressful NICU environment can foster negative behaviors. Interpersonal relations among professional staff members, administrative problems, understaffing, overwork and productivity expectations promote disruptive and corrosive behaviors such as bullying.** (PAGE 9) • In our study, with the self labeling definition bullying referred at one third of respondents. On the other hand, half of bullied respondents did not self label themselves as victims, possibly due to non-recognition or not-knowing or no-realization of this behavior.[28] **As studies have shown if the prevalence of bullying is based**

			on a given definition, many victims are either unaware or do not admit being bullied or decline the victim role as it suggests weakness and passivity.[38,39] (PAGE 9) • The rate of witnessing bullying of others was found much higher than Quine and Carter studies, **possibly due to the fact that experiencing bullying is easier to refer than to admit.[2,3,15] (PAGE 9)** • Demographic group differences for victims of bullying were found only for gender and job experience in the field. **Higher bullying prevalence among women compared to men, as this study shows, has been referred by many studies, while others didn't report any differences.[7,40-42] This lack of consistency could be attributed to discriminations that both genders can suffer or to the broader dysfunctional practices (involving sexual harassment) that bullying actions incorporate. (PAGE 9)** • Regarding organizational factors we did not find any differences related to job contract, job position and professional group, **supportive to Kivimäki et al.[1] findings. The fact that bullying prevalence did not differ for doctors and nurses, job position and educational level at both professional groups, doesn't support a pattern of discrimination as other studies have shown[15,17]. Workplace bullying is a wide spread complex phenomenon, both in interpersonal and organizational level, not involving certain professional groups[1].** (PAGE 9) • Crude NAQ-R score was found significantly higher according to gender (higher for women), age (higher for younger employees), job experience in the field (higher for less years of experience) and witnessing bullying of others. **This finding supports Rayner et al, and Hoel & Cooper et al studies who noted that younger employees being in a subordinate position are more frequently exposed to bullying behavior. [42,43] On the contrary, Einarsen and Skogstadt found the exactly opposite results with seniors being bullied more often than younger employees.[44] (PAGE 9)** • Seniors/supervisors, other than colleagues and parents were reported as the most common sources of bullying[17]. **Many other studies have shown that bullying is a top-**

			down process with most of the perpetrators being in a superior status supportive of imbalance of power.[17,43] **Also, the fact that bullying behavior occurs between peers in team working environments (as NICU) is in line with Zapf et al study.**[46] Although male dominated organizations are associated with high rates of bullying, our study showed that it also exists **in a highly female dominated environment.**[5] The fact that perpetrators female and male were mainly 45-64 yrs old signals the need for intervention policies. **Furthermore, our study showed that half of male or female perpetrators were more than one person.** Nearly 70 percent of respondents referred being bullied in presence of others suggesting that bullying takes place both on an individual and social-group level.[12] Underreporting bullying associates to understanding the barriers that healthcare professionals arise to report bullying. **Reasons for not reporting were mainly personal self dealing and fear for consequences. The last could be attributed to the belief that bullying may have an impact on their professional progress.**[47] Anti-bullying policies should decrease barriers to reporting bullying, and increase staff confidence in preventing and dealing with this behavior. **Our study sresses out that personality trait of victims, management and workplace culture were considered as the main causes of bullying. Personality trait characterizes people who can be "easy to target" persons, supporting the widespread concept of "blaming the victim**". [8,48] (PAGE 10) • In our study respondents being bullied, those self labeling themselves as victims and witnessed bullying of others, had higher GHQ-12 scores indicative of psychological stress. **Doctors among other healthcare workers are at increased risk for occupational stress.**[49] **In our study, either they had been bullied or not, doctors had higher levels of psychological distress than nurses and females than men. The high GHQ-12 score among doctors reflects the effect of pressurized working conditions, heavy workload and daily crucial decisions about life and death. Weinberg and Creed's study showed that stressful conditions at work contribute to psychological distress, as a result of the vicious cycle that heavy workload creates with anxiety and depression.**[27,29] Moreover, a quarter of doctors and nurses reported high GHQ-12 scores indicative of severe psychological distress

			as other studies have noted.[50] GHQ-12 showed no differences regarding other characteristics (job grade, educational level, job contract, job experience in the field, hours worked /week, BMI, smoking, alcohol consumption) **as noted in other studies.** [49,51] (PAGE 10) • Correlation of bullying with mental health status, as high NAQ scores were accompanied by high GHQ-12 scores, shows bullying association with psychological distress. **Einarsen et al portray victims of bullying, as persons with low self-confidence, being depressed, anxious, suspicious, uncertain and disappointed.**[28] (PAGE 10) • Those who had been bullied and were on psychological support had better mental health status (lower GHQ-12 score) than those who had been bullied and were not on psychological support. On the other hand, the non-bullied and psychologically supported compared to non-bullied and not psychologically supported respondents had worse mental health status (higher GHQ-12 score). **As other studies have shown an association between mental health status bullying and psychological support exist, with the last considered as a buffer against bullying.**[5,8] (PAGE 11)
Generalisability	21	Discuss the generalisability (external validity) of the study results	The disturbing extremely high rates of bullying, along with the higher levels of psychological stress for those being bullied, reveal the negative effects of bullying on both professional groups of doctors and nurses. A supportive work environment protects staff and moderates any harmful effects from bullying behavior. Management of bullying must be based on freely reporting bullying behaviors and staff should not be reluctant to report bullying. First priority for doctors and nurses working in the NICU should be team work and cooperation. More studies for disruptive behaviors such as bullying are needed, considering the demanding NICU environment, the pressured working conditions, the existing heavy workload and conflicts among staff. (PAGE 11)
Other information			
Funding	22	Give the source of funding and the role of the funders for the present study and, if applicable, for the original study on which the present article is based	No external funding was provided.

*Give information separately for cases and controls in case-control studies and, if applicable, for exposed and unexposed groups in cohort and cross-sectional studies.

Note: An Explanation and Elaboration article discusses each checklist item and gives methodological background and published examples of transparent reporting. The STROBE checklist is best used in conjunction with this article (freely available on the Web sites of PLoS Medicine at http://www.plosmedicine.org/, Annals of Internal Medicine at http://www.annals.org/, and Epidemiology at http://www.epidem.com/). Information on the STROBE Initiative is available at www.strobe-statement.org.