

## ANXIETY DISORDERS AND MOOD DISORDERS IN HOSPITAL DOCTORS: A LITERATURE REVIEW

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### ABSTRACT

This paper is focused on mental health among hospital doctors. This is a review of the literature dated January 1, 2005–December 31, 2019, from the MedLine and Scopus databases. The prevalence of post-traumatic stress disorder and anxiety disorders ranged 2.2–14.6% and 10.5–19.3%, respectively. Several risk factors were significant, such as having had blood exposure accidents, or the interaction between family and work life. The prevalence of mood disorders ranged 7.8–48%. Occupational constraints, such as night work or psychological demand, were related to the presence of mood disorders. This literature review showed the prevalence of disorders that can be reactive at work in hospital doctors. The risk factors studied can guide prevention policies within hospitals. *Med Pr.* 2021;72(2):163–71

**Key words:** stress disorders, medical staff, hospital, anxiety, post-traumatic, mood

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Received: January 14, 2020, accepted: October 21, 2020

### INTRODUCTION

Hospital medicine is meaningful for doctors who want to practice medicine with access to the best technologies, the latest discoveries, and a network of specialized colleagues. However, practicing hospital medicine sometimes seems difficult due to challenging patient situations, administrative procedures that make little sense to caregivers, relational difficulties within certain teams, working hours that are not always compatible with one's family life, and the number of nights and shifts conditioned by the duty of the continuity of care [1–5].

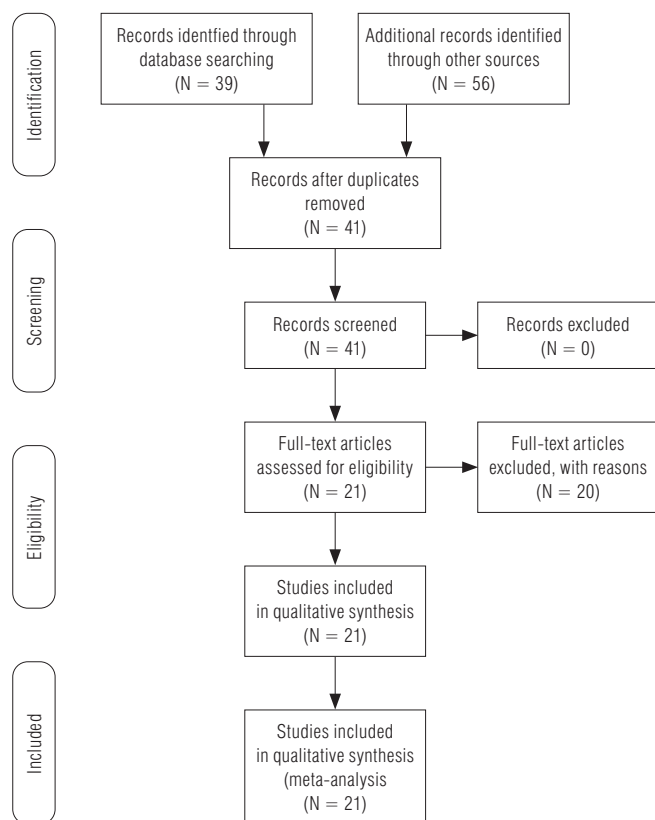
Yet, despite these professional constraints and risks, doctors continue to invest in their work. Their motives are often altruistic and professional, to the point of neglecting themselves [6,8–10]. Two orders of consequences are thus classically explored, i.e., the impact on the quality of life and mental health of doctors, and the effect on the quality of care [11,12]. These

can trigger multiple health consequences for hospital doctors. Burnout syndrome is often described, but it does not exist in the Diagnostic and Statistical Manual of Mental Disorders (DSM), either in DSM-4 or DSM-5 [1,2,13]. Anxiety disorders and mood disorders can also occur [14].

Therefore, the purpose of this article is to review the studies on anxiety disorders (including post-traumatic stress disorder [PTSD]) and mood disorders in the population of hospital doctors in 2005–2018.

### METHODS

This article is a review of the literature dated January 1, 2005–December 31, 2019. Searches were conducted using the MedLine, Propero and Scopus databases. The key words were as follows: “medical staff, hospital” (Mesh) and “anxiety” (Mesh) or “performance anxiety” (Mesh) or “anxiety disorders” (Mesh); and “medical



**Figure 1.** Flow chart according to Prisma

staff, hospital” (Mesh) and “depression” (Mesh) or “depressive disorder” (Mesh) or “mood disorder” (Mesh). For Scopus, the following keywords used were: “hospital doctors” or “doctor” and “hospital,” and “anxiety,” “depression.” Articles in English, French, Spanish, Italian and German were selected. To search for gray literature, the open archive site and the following website: <http://www.these.fr> were used.

Two occupational physicians selected articles based on pre-established criteria. The inclusion criterion was the following: articles had to deal with mood disorders or anxiety disorders in hospital doctors. Only descriptive (prevalence studies) or analytical (with a causal link to work) epidemiological articles were selected.

Any articles that did not meet this criterion were excluded, as were case report articles or previous literature reviews. Articles on medical students and medical residents were included only if they also focused on senior doctors, and the populations were discernible in the article. The criteria of article quality also made it possible to exclude the articles not specifically investigating the population of hospital doctors (e.g., those focusing on physicians in private practice); in some cases, deliberation between the authors made it possible to exclude

certain studies according to the assessment of their selection or classification bias (e.g., a definition of the disorder) (Figure 1).

For the analysis, the articles were classified by their theme according to the disorders studied (anxiety disorders, mood disorders) and the study of risk factors (including the quality of life, and the *Job Content Questionnaire*). For each of these disorders, the analysis distinguished the type of the study, the methodology used (in particular the type of the standardized questionnaire used), prevalence and associated risk factors. For significant risk factors in the literature, the authors established a classification according to a qualitative analysis method by axial and selective coding [15].

## RESULTS

Anxiety disorders are considered in several ways in the literature, involving stress feeling, anxiety or anxiety disorder [16–26,40], with several different questionnaires being used (Table 1).

Depending on the questionnaires used and the populations under consideration, the rate of anxiety disorders ranged 2.2–14.6%.

Depending on the studies, the PTSD prevalence was 10.5–32.3% (Table 2). The studies focused on the risk of developing PTSD following physical trauma or war trauma. Few risk factors were adequately studied to identify causal links such as variation in schedules or the number of shifts [19,27–30] (Table 3). Zhou et al. [40] pointed out several specific risk factors for mental health; namely, being female, expressing dissatisfaction or average satisfaction with income, and a good or very good self-perceived psychological endurance, when faced with an emergency situation, were associated with a reduction in PTSD symptoms.

Mood disorders were studied in hospital doctors by 7 teams worldwide [24–26,31–34] (Table 4). The levels of prevalence were very heterogeneous from one study to another, ranging 6.8–48%. However, the study showing that 48% of doctors had a high chance of having a mood disorder took place in Lebanon, in a war context.

Five major types of risk factors were found [24,27,28,31,34] (Table 5). Significant risk factors for mood disorders were grouped into several categories, such as the doctor’s intrinsic characteristics (resilience, investment in hobbies, etc.) or work-related factors (hours, compliance with organizational norms, etc.) [24,27,28,31,34,39] (Table 5). Tanner et al. [41] performed a 2-step study, at a 12-month interval, on

**Table 1.** Main results of the studies on anxiety disorders

Study	Population	Method	Main results
Stress feeling			
Allcock et al., 2008, UK [23]	11 gynecologists night shift	<i>Spielberger State-Trait Anxiety Inventory</i> a 1-year prospective study on the link between anxiety and the number of acts outside normal working hours	STAI-T (M±SD) = 42.9±9.23
Anxiety			
Erdur et al., 2006, Turkey [24]	192 Turkish emergency physicians	a cross-sectional study conducted in May 2004 multicenter <i>Beck Anxiety Inventory</i>	14.6% (N = 28)
Ahmed et al., 2009, UAE [25]	93 university hospital doctors	a cross-sectional study conducted in November 2008 <i>Beck Anxiety Inventory</i>	2.2% (N = 2)
Yates et al., 2011, UK [26]	19 emergency physicians 16 orthopedic doctors in comparison with paramedics	a cross-sectional study conducted in 2011 GHQ-12 <i>Hospital Anxiety and Depression Scale</i> <i>Brief COPE</i> questionnaire	emergency physicians were more likely to be anxious and to have higher GHQ-12 results than orthopedic surgeons
Zhou et al., 2018, China [40]	1557 Chinese doctors	a cross-sectional study conducted in July–September 2015, among 27 hospitals, participation rate: 92% SAS	SAS scores M = 55.26

GHQ-12 – *General Health Questionnaire-12*, SAS – *Self-rating Anxiety Scale*, STAI-T – *State-Trait Anxiety Inventory*.

**Table 2.** Main results of the studies on post-traumatic stress disorder (PTSD)

Study	Population	Method	Main results
Ben-Ezra et al., 2008, Lebanon [16,17]	doctors and nurses, during war in Lebanon	a cross-sectional study an auto-questionnaire after a traumatic event <i>Events Scale-Revised</i>	STAI-T (M±SD) = 42.9±9.23
Alden et al., 2008, Canada [18]	100 emergency physicians	<i>Post-traumatic Stress Diagnostic Scale</i> a comparison of PTSD between the group having experienced a direct attack (76% female) and the control group (80% female)	the physicians with direct trauma had a higher impact on their health at work than the doctors who witnessed such trauma: a lower work satisfaction, a higher feeling of insecurity
Naghavi et al., 2013, UK [19]	147 young doctors in university hospitals	a cross-sectional study of PTSD in doctors related to BEAs	12% (N = 9 out of 77 doctors who had had a BEA)
Wu et al., 2009, China [20]	114 doctors following the SARS epidemic	a prospective survey among 549 randomly selected hospital employees	10.5% (N = 12)
Lin et al., 2007, Taiwan/China [21]	83 Chinese doctors and nurses	a cross-sectional study conducted in August 2003 <i>Davidson Trauma Scale-Chinese</i> GHQ-12	19.3% (N = 16)
Einav et al., 2008, Israel [22]	212 Israeli doctors	a cross-sectional study conducted in 2008 <i>Post-traumatic Symptom Scale – Self-Report</i>	15.6% (N = 33)
Zhou et al., 2018, China [40]	1557 Chinese doctors	a cross-sectional study conducted in July–September 2015, among 27 hospitals, participation rate: 92%	32.3% (N = 225)

BEA – blood exposure accident, PCL-C – *Post-traumatic Stress Disorder Checklist-Civilian Version*.  
Other abbreviations as in Table 1.

161 German hospital doctors, to determine whether compliance with organizational standards had an effect on depressed moods. The authors showed that this

was the case, to a large extent. They also showed that the ability to participate in leisure activities was a protective factor. What was innovative in their study was

**Table 3.** Significant risk factors for anxiety disorders or post-traumatic stress disorder (PTSD) of hospital doctors

Item and sub-item	Study	Results
<b>Intrinsic</b>		
live philosophy		
meaning of work	Stenmarker et al., 2009, Sweden [27,28]	perception of the meaning of work is a protective factor correlation factor: $-0.42$ – $(-0.40)$ depending on seniority
resilience when faced with emergency situations	Zhou et al., 2018, China [40]	protective factor OR = 2.38 (95% CI: 1.7–3.1)
gender		
female	O'Donnell et al., 2012, UK [29] Zhou et al., 2018, China [40]	higher STAI score in women, 94 vs. 88 ( $p < 0.01$ ) being a woman is a protective factor, OR = 0.535 (95% CI: 0.339–0.884)
<b>Privacy</b>		
interactions between professional and private lives	Stafford et al., 2010, Australia [30] Australian gynecologists	80.8% of doctors considered this to be their main source of stress
<b>Professional factors</b>		
accidental blood exposure		
if present, the risk of PTSD	Naghavi et al., 2013, UK [19]	OR of PTSD = 4.28 (95% CI: 2.16–8.47)
respect for the doctor		
verbal abuse	Zhou et al., 2018, China [40]	correlation factor: $\beta = 0.88$ ( $p = 0.01$ )
workload	Zhou et al., 2018, China [40]	2.351 ( $p < 0.001$ )

assessing the organizational autonomy left to the doctor and its link with both the respect for organizational norms and the freedom to participate in leisure activities. Autonomous doctors tended to invest too much in their work, rather than respecting labor standards (hours, etc.) or participating in leisure activities. The authors concluded that hospital administrations should help doctors to better organize their work.

Other parameters related to anxiety disorders and mood have been shown in the literature without methods being adapted to quantitatively assess the causal link. This is particularly the case of the study by Teufel et al. [32] who carried out their work on a population of doctors on strike in a German university hospital. The statements of these physicians illustrated the importance of the relationships with colleagues and with the hierarchy for mental health at work. However, these relationships were disrupted during social movements: 54.8% thought that their relationship with their head of department was degraded, and 85.5% thought that, conversely, mutual help and solidarity among colleagues had improved during that period. Other parameters were simply reported separately, such as violence and attacks on the care staff by agitated patients [35].

The question of death has been addressed in the literature to find out whether hospital doctors had any

difficulty in coping with their patient's death. Moores et al. [36] studied the reactions of 188 English hospital doctors to death by means of a questionnaire. They found that 5–17.5% of the surveyed doctors reported moderate to severe symptoms following their patient's death, such as sleep disorders, appetite disorders, crying, or fatigue. In their sample, 61% of the doctors said they had not received any training for these situations. The defense strategies were diverse: 64.4% needed to be alone while 36.2% felt the need to talk; 26.6% practiced sport and 21.8% found solace in religion.

As regards anxiety, some factors were not analyzed using methods that would allow researchers to know if they were risk factors. For example, the SARS outbreak in Asia has been studied. Wong et al. [37] showed the anxiety state on a visual scale and the presence of defense strategies. Other studies focused on the interaction between work and family constraints [30].

The issue of suicide, or suicidal risk, is also addressed in the literature. In England, Anderson et al. [38] interviewed 52 physicians (emergency physicians, pediatricians and psychiatrists) and 127 nurses in the same services, using the questionnaire intended to gather suicide opinions. The main result was the identification of subjective strategies for assessing the mental health of patients by physicians and nurses. The authors concluded

**Table 4.** Prevalence of mood disorders in hospital doctors

Reference	Population	Method	Main results
Erdur et al., 2006, Turkey [24]	192 Turkish emergency physicians	a cross-sectional study conducted in May 2004 multicenter <i>Beck Depression Inventory</i>	15.1% (N = 29)
Ahmed et al., 2009, UAE [25]	93 university teaching hospital doctors	a cross-sectional study conducted in November 2008 <i>Beck Depression Inventory</i>	7.8% (N = 7)
Yates et al., 2011, UK [26]	19 emergency physicians 16 orthopedic doctors in comparison with paramedics	a cross-sectional study conducted in 2011 GHQ-12 <i>Hospital Anxiety and Depression Scale</i> <i>Brief COPE Questionnaire</i>	emergency physicians: 21% (N = 4) orthopedists: 6.3% (N = 1)
Wang et al., 2011, Taiwan/China [31]	473 hospital doctors from Taiwan/China (15.2% female vs. 84.8% male)	a prospective study conducted in 2007 14 hospitals Taiwan/China depression survey <i>Job Content Questionnaire</i>	13.3% (N = 63) psychological demand and decision-making flexibility higher than the Taiwan/Chinese national average
Teufel et al., 2007, Germany [32]	106 university teaching hospital doctors (40% female)	a cross-sectional study conducted during a strike <i>Symptom Checklist SCL-90-R</i>	13.6% (N = 14)
Sharma et al., 2008, UK [33]	501 English surgeons	a cross-sectional study GHQ-12 <i>Maslach Burnout Inventory</i> <i>Coping Questionnaire</i>	33% (N = 163)
Palgi et al., 2009, Lebanon [34]	38 Lebanese doctors, during wartime	a cross-sectional study conducted in summer 2006 <i>22-item Impact of Event Scale-Revised</i> (CES-20)	48% (N = 18)
Haskins et al., 2015, USA [39]	university population, USA	a survey conducted in 2013–2014 PHQ-9	33% (N = 31)
Zhou et al., 2018, China [40]	1557 Chinese doctors	a cross-sectional study conducted in July–September 2015, among 27 hospitals, participation rate: 92% SDS	SDS index 0.67

CES-20 – Center for Epidemiological Studies Scale-20, PHQ-9 – Patient Health Questionnaire-9, SDS – Self-rating Depression Scale.  
Other abbreviations as in Table 1.

that suicide prevention could be improved through better training of caregivers.

This literature review showed the high prevalence of anxiety and mood disorders in doctors, i.e., 10.5–19.3% and 7.8–48%, respectively. Several risk factors were studied and some were significant. The levels of prevalence of anxiety disorders in doctors are comparable to those found in the general population: 15% among men and 25% among women, on average [42]. The prevalence of PTSD among caregivers varies in the literature between 0–38.5%, depending on the studies and services studied [43], and it is higher than that of the general population in the world, between 0.3–6.1% over the lifespan, and comparable to that of populations exposed to a natural disaster, between 30–40% [44]. The prevalence of mood disorders among physicians is higher than that of the general population, which is 10% for men and 20% for women, on average [45].

This literature review took into account only hospital doctors. Some articles were excluded because the results did not differentiate between medical and non-medical

staff, or between residents and physicians. This is particularly the case with the study by Koren et al. [46]. In addition, this literature review focused on the emergence of anxiety and mood disorders. However, some articles have shown that exposure to serious events is a source of maturity for caregivers [47]. These articles were, therefore, not taken into account because of their nosographic inaccuracy. Studies on residents were not included, although this population is affected by these disorders, too [48,49]. This review also exhibits some limitations as regards its methodology. Querying the databases and verifying the protocol depot sites seemed to allow for some completeness. However, the authors did not interview the teams that published papers on the subject; some unpublished data during their studies may have enriched this article.

Similarly, a multilingual exploration of the gray literature was not carried out. The bases used mainly concerned the French medical world. In addition, it was not possible to use certain study databases, often on therapeutic trials. However, as this article had a descriptive

**Table 5.** Significant risk factors for mood disorder among hospital doctors

Item and sub-item	Study	Results
<b>Intrinsic</b>		
gender		
female	Wang et al., 2011, Taiwan/China [31]	20.8% vs. 11.9% (p = 0.04)
life philosophy		
meaning of work	Stenmarker et al., 2009, Sweden [27,28]	perception of the meaning of work is a protective factor correlation factor: -0.64-(-0.59) depending on seniority
defense strategy		
coping mechanisms in place	Stenmarker et al., 2009, Sweden [27,28]	the more effective the defense strategies are, the fewer the signs of depression correlation factor: -0.41-(-0.36) depending on seniority
leisure activities	Tanner et al., 2017, Germany [41]	protective factor
resilience when faced with emergency situations	Zhou et al., 2018, China [40]	protective factor OR = 0.98 (95% CI: 0.98-0.99)
<b>Social status</b>		
temporary contract	Wang et al., 2011, Taiwan/China [31]	9.97% vs. 13.3% (p < 0.001)
marital status		
single	Wang et al., 2011, Taiwan/China [31]	20.97% vs. 10.76% (p = 0.01)
<b>Professional constraints</b>		
night work and staggered hours	Wang et al., 2011, Taiwan/China [31]	increase according to the number of nights worked each month 8.83% if <4 nights/month 21.01% if >8 nights/month
respect for organizational norms	Tanner et al., 2017, Germany [41]	depressive mood risk factor
<i>Job Content Questionnaire</i>		
decision-making flexibility	Wang et al., 2011, Taiwan/China [31]	p < 0.01
psychological demand	Wang et al., 2011, Taiwan/China [31]	p < 0.01
social support	Wang et al., 2011, Taiwan/China [31]	p < 0.01
respect towards the doctor		
feeling respected	Zhou et al., 2018, China [40]	protective factor OR = 0.98 (95% CI: 0.98-1.99)
behavioral factors		
drinking alcohol	Wang et al., 2011, Taiwan/China [31]	38.10% vs. 12.17% (p < 0.001)
<b>Pathologies</b>		
anxiety disorder		
absence	Erdur et al., 2006, Turkey [24]	OR = 0.47 (p < 0.001)
post-traumatic stress disorder		
presence of PTSD in wartime situations	Palgi et al., 2009, Israel [34]	OR = 18.86 (95% CI: 4.08-87.7)

and analytical epidemiological purpose to better understand the state of health of doctors in hospitals, it did not seem necessary to ensure the quality of the analysis for this topic. The main limitation of this study was the possible variability of nosographic feature definitions. For example, some entities have only been defined recently.

Additionally, mood disorder or depression were terms understood as generic. The articles did not establish finely whether they were disruptive disorders, with bouts of aggression >3 times/week, or characterized a depressive disorder lasting for >2 weeks but <2 years, with fewer than 3 factors of depreciation. This would

have corresponded to a persistent depressive disorder, according to DSM-5. Similarly, in a review of the epidemiological literature, the term “anxiety disorder” does not make it possible to know whether it is simply a question of anxious symptoms or anxiety syndromes, or truly established anxiety disorders. Anxiety disorders need to be described more precisely to identify the precise classification: generalized anxiety disorders, reaction anxiety disorders, panic attacks or social anxiety. The tools used in these articles had the same limitations as for mood disorders, according to DSM-5 [50]. However, this limitation does not invalidate this literature review.

In this article, the levels of prevalence are estimates of a high probability of having an anxiety disorder or mood disorder; only an assessment by a physician would allow a precise diagnosis, which was not the goal here. One needs to take into consideration the fact that the authors of the articles used were often well aware of the nosological limitation of the epidemiological approach and that the tools remain appropriate for population-only studies, which was the objective assumed here. Knowing the population at least with symptoms can be used to estimate the risk of developing disorders and to objectify the state of suffering in each study. The convergence of data suggests that hospital doctors are at risk for anxiety disorders and work-related mood disorders.

This literature review has highlighted a high prevalence of these problems among hospital doctors. In addition, several articles have shown significant risk factors. This review could help to organize prevention.

Indeed, in the literature, the prevention of stress or depression focuses on individual measures, i.e., coping, the quality of life, and relaxation or listening to music [26,28,51,52]. For the prevention of mood disorder, it was proposed to include some preparations during studies, or to establish websites for doctors, or measures to reduce violence [38,53,54]. For PTSD, the measures studied in the literature included mainly debriefing [18,55,56] while for surgeons, experience was described as a protective factor [57]. In this study, PTSD decreased with seniority in the profession. However, it was difficult to distinguish the healthy worker effect. This literature review showed that some factors were related to these occupational risks. Prevention should, therefore, target these factors. This is all the more important since hospital doctors must work within a doctors' network and be able to attend to their patients, to listen to them, and to see the mode of communication based on empathy or humor being put to work [58,59].

## CONCLUSIONS

The mental health of hospital doctors is a public health issue. This literature review showed that the prevalence of anxiety disorders, on the one hand, was high among hospital doctors, but comparable to that of the general population. The prevalence of depression, on the other hand, was much higher than in the general population.

Clinical studies should be launched to better identify real rates, by focusing research on the pathologies referenced in DSM-5. Several risk factors emerged from the literature and could be the focus of prevention campaigns. The link between the mental health of physicians, and their occupational risks and the quality of care, could serve as a motivation for prevention campaigns at the institutional level.

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