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Mental Disorders Among Healthcare Students Attending a Large University Hospital in Milan, Italy

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Abstract

Background: *The high incidence rates, treatment difficulties, and tendency to become chronic, which subsequently affects personal and occupational functioning, make mental health disorders among the most important public health concerns. In this context, healthcare university students (HS) appear to be more vulnerable to psychological distress than others.* **Objective:** *Investigate the prevalence of diagnosed mental illness among different groups of HS to detect students who may be psychologically vulnerable and determine whether the implementation of support interventions is necessary.* **Methods:** *All HS who had a clinical examination performed by an occupational physician at our occupational health unit between 2021 and 2022 were included in our case series. Data were collected and analyzed as part of the occupational physicians' health surveillance program.* **Results:** *out of 679 HS (507 females, 172 males, aged 22.2±3.9 mean±s.d) undergone clinical examination at our Occupational Health Unit, 36 (5.3%) reported a diagnosed psychiatric illness, and 20 were receiving pharmacological therapy at the time of the visit. A higher prevalence of psychological disorders has been highlighted in females (6.1% vs 2.9% in males) and students of the mental health sector (11.1%) when compared with others. A fit-to-work judgment with prescription was necessary for 16.7% of students with mental diseases. The presence of psychiatric disorders was associated with underweight (27.8%) and higher smoking habit (44.4%).* **Conclusions:** *These results underline the necessity of improving the current health surveillance protocols, which should also evaluate students' psychological fragility and implement effective intervention strategies to promote their health and wellbeing.*

1. Introduction

The World Health Organization's definition of health includes not only physical but also mental and social well-being, introducing the idea of a holistic approach to health [1]. Due to their high incidence rates, treatment challenges, and propensity to become chronic, mental health disorders are one of the most significant public health issues [2].

It's known that the transition to university coincides with a critical period in the biological, psychological, and social development of students. Despite being a crucial transitional period, Literature reports few epidemiological studies about diagnosed mental health problems in college and university students [3]. Nonetheless, several studies examined the frequency of signs of psychological discomfort in university students, suggesting that 12-50% of

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university and college students meet the criteria for one or more common mental disorders [4-6]. A national survey in Norway reported a high prevalence of both mental health problems [7] and suicidal ideation and non-suicidal self-harm [8] among college and university students. Furthermore, there are some suggestions about the impact of the COVID-19 pandemic on college students' mental health, as evidenced by the rise in the number of students experiencing negative emotions and psychological issues during this period [9, 10].

In this context, there is significant evidence that healthcare students (HS) have high levels of mental discomfort and psychological distress with subsequent concerning effects on personal and occupational functioning [11]. A recent systematic review reported an estimated frequency of depression symptoms in medical students around the world at about 27.2% [12], while the global prevalence rate of anxious features among medical students was 33.8% [13]. Recent studies also highlighted a higher prevalence of sleep disorders in HS compared to the general population [14, 15], a critical issue in this population since sleep disorder symptoms may result in errors, accidents, or low academic performance [16]. During the COVID-19 pandemic, higher levels of anxiety, stress, and exhaustion were also reported in this category of university students [17].

There is evidence of a relationship between mental disorders and unhealthy lifestyle habits: a recent Italian study evaluated the cardiovascular risk in patients with mental illness compared to a control group. It highlighted that smoking habits were more common in people with mental problems (51.3%-64.7%) than control (20.4-25.9) [18]. Other studies showed that patients with mental illnesses are twice as affected by obesity, diabetes, and metabolic syndrome than the general population and, accordingly, are at increased risk of death due to cardiovascular disorders [19]. On the other hand, several mental diseases, including those in the "eating disorders" group, could be associated with underweight conditions, such as unhealthy and restricted nutrition habits with subsequent effects on the endocrine system [20], bone metabolism [21], and cardiovascular system [22].

The first aim of this study was to evaluate and compare the prevalence of diagnosed mental illness in different groups of HS at the start of their practical training to establish the necessity of implementing health surveillance programs with the intention of identifying and assisting students with psychological fragility. Secondarily, the study evaluated the correlation between mental disease and unhealthy lifestyle habits to identify the necessity of implementing health promotion programs in the student population.

2. Materials and Methods

Luigi Sacco University Hospital is part of the Italian public healthcare system. It has an agreement with the University of Milan, so resident doctors and numerous students attend its departments and clinics. According to Italian Law (Legislative Decree n. 81 of 2008, 9th April) [23], before beginning their training internship, all students are required to undergo a medical examination by an occupational physician to identify any health issues that could contraindicate the exposure to specific risk agents during the traineeship. A detailed medical history regarding past and present pathological conditions, chronic therapies, and lifestyle habits is part of the current health surveillance protocol. It also includes general clinical evaluation and specific clinical evaluation for the musculoskeletal system and blood chemistry tests aimed to determine susceptibility to exposure to biological agents and adequate vaccination coverage of the students. After the medical examination, the occupational physician issues a fitness-to-work judgment to protect the health and safety of the students, as well as all workers.

Our case series included all HS undergone clinical examination by an occupational physician at our Occupational Health Unit between 1st January 2021 and 31 December 2022. Presented data were collected and analysed as part of the health surveillance program carried out by the Occupational Health Unit. Data were presented as a whole and categorized by course of study. In particular, students were divided into 4 categories based on the study courses they had taken: medicine and surgery (MS), nursing (N), the mental health sector (MH, including

psychology students and psychiatric rehabilitation students), and other courses of study (O; including few students belonging to the courses of pharmacy, physiotherapy, orthoptists, and others not included in the previous groups). Resident doctors were not included in the study.

All data shown in our study were expressed as absolute numbers, percentages, and/or mean ± SD. The Student's t-test analysed between-group differences for the continuous variables, while categorical variables were analysed by the Fisher exact test. Differences in age, sex, and course of study were considered in data analysis. A p-value <0.05 was considered significant. Statistical analysis was performed with Microsoft Excel (Microsoft Office for Apple, "Office 365" Version) and R-Studio (*R Core Team (2019). R: A language and environment for statistical computing. R Foundation for Statistical Computing, Vienna, Austria. URL:* https://www.R-project.org/).

3. Results

679 HS (507 females, 172 males, aged 22.2±3.9 mean±d.s.) underwent clinical examination by Occupational Physician at our Occupational Health Unit between the beginning of 2021 and the end of 2022. Out of them, 400 students (58.9%) attended MS, 107 (15.8%) N, 81 (12.0%) MH and 91 (13.3%) O.

As shown in Table 1, at the time of clinical examination, 72% of visited HS had a normal weight (body mass index - BMI - between 18 and 24,9 kg/m^2) while 13% suffered from underweight (BMI <18 kg/m^2) and 15% were overweight/obese (BMI > 24,9 kg/m^2). Smoking habit was referred by 19.1% of HS. At the time of the visit, 36 HS (5.3%) reported documentation related to a mental illness just diagnosed by a psychiatrist, and 20 of them (55.6%) were receiving pharmacological therapy. Out of these 36 HS, 47.2% suffered from anxiety, 30.6% had a diagnosis included in the "eating disorders" group (including anorexia nervosa, bulimia nervosa, and binge eating disorder), 13.9% suffered from depression, 5.6% had a positive clinical history for episodes of panic crisis, and 1 student was affected by delusional disorder.

Table 1. Demographic and clinical characteristics of the study population.

	Healthcare Students	
	n	**%**
Students		
All	679	100.0%
Females	507	74.7%
Males	172	25.3%
Age (years), mean±s.d.	22.2±3.9	
University Courses Attended		
Medicine and Surgery (MS)	400	58.9%
Nursing (N)	107	15.8%
Mental Health sector (MH)	81	12.0%
Other courses (O)	91	13.3%
BMI		
<18 kg/m^2	88	13.0%
18-24.9 kg/m^2	489	72.0%
25-30 kg/m^2	90	13.2%
>30 kg/m^2	12	1.8%
Smoking Habit		
Yes	130	19.1%
No	549	80.9%
Diagnosed Mental Illness		
Yes	36	5.3%
No	643	94.7%
Type of Psychiatric Disease (out of 36)		
Anxiety	17	47.2%
Eating disorders	11	30.6%
Depression	5	13.9%
Panic crisis	2	5.6%
Delusional disorder	1	2.7%
Fitness to Work Judgement		
Fit to work	671	98.8%
Fit to work with limitation or prescription	8	1.2%
Unfit to work	0	0.0%

Out of the overall population, in 98.8% of the cases, the Occupational Physician expressed a full fit to work judgment after the medical examination. In 1.2% of cases, a fit-to-work judgment with

Table 2. Clinical data and smoking habit: comparison between healthcare students with and without diagnosed mental diseases.

	No Mental Disorders n. (%)	Diagnosed Mental Disorders n. (%)	p
All (n. 679)	643 (100)	36 (100)	-
Females (n. 507)	476 (74.0)	31 (86.1)	0.11
Age (years)	22.1±3.9	24.1±4.1	0.002
BMI			
<18 kg/m²	78 (12.1)	10 (27.8)	0.02
18-25 kg/m²	466 (72.5)	23 (63.9)	0.26
>25 kg/m²	99 (15.4)	3 (8.3)	0.59
Smoking Habit	114 (17.7)	16 (44.4)	<0.001
Fitness to Work Judgement	**n. (%)**	**n. (%)**	**p**
Fit to work	641 (99.7)	30 (83.3)	-
Limitation or prescription	2 (0.3)	6 (16.7)	<0.001
Unfit to work	0	0	-

prescription was required: in two cases, specifically, a fit-to-work judgment was accompanied by recommendations regarding the exposure to biological risk in relation to student's increased susceptibility, and in eight cases, a close monitoring schedule for follow-up visits was indicated to track the development of the underlying disease throughout the student's internship.

When compared with students without psychiatric illness, students with mental diseases were older (24.1±3.9 y vs. 22.1±4 y, p=0.002), and the diagnosis of mental diseases, even if not significant, showed a higher prevalence in the women group (6.1%) than in men group (2.9%) (p=0.11). Related to life habits, when compared with students without mental disorders, in students with psychiatric diseases a higher prevalence of smoking habits (44.4% vs. 17.7%, p<0.001) and underweight (27.8% vs. 12.1%, p=0.02) were found. In 98.6% of the students without psychiatric illness, the Occupational Physician expressed a full fit to work judgment following the medical examination. In this group, a fit work judgment with prescriptions was required in two cases related to students' increased susceptibility to biological risk. Related to the group of students with psychiatric diseases a fit to work judgment with prescription was expressed by Occupational Physician in 16.7% of cases with the recommendation of a close monitoring schedule for follow-up visits to track the development of the underlying disease throughout the student's internship (Table 2).

Concerning the type of university course attended, a higher prevalence of psychiatric disorders was found in MH students than in other HS (11.1% vs 4.7%, p=0.02) (Figure 1). As shown in Figure 2, when compared with students attending other university courses, a higher prevalence of eating disorders (4.7%) and depression (3.7%) was found in MH students. In comparison, diagnosis of anxiety (3.2%) was more common in MS students.

4. Discussion

Healthcare settings can be a demanding workplace, with long and uncertain working hours, severe workloads, training competition, high responsibility, and continual exposure to suffering, illness, and death [24]. Increasing evidence in Literature shows that healthcare workers around the world report high levels of depression, anxiety, stress, burnout, and post-traumatic stress disorder [25]. In this context, it is crucial to identify, at an early phase, psychological fragility in order to put all the necessary precautions at work to safeguard the health and safety of

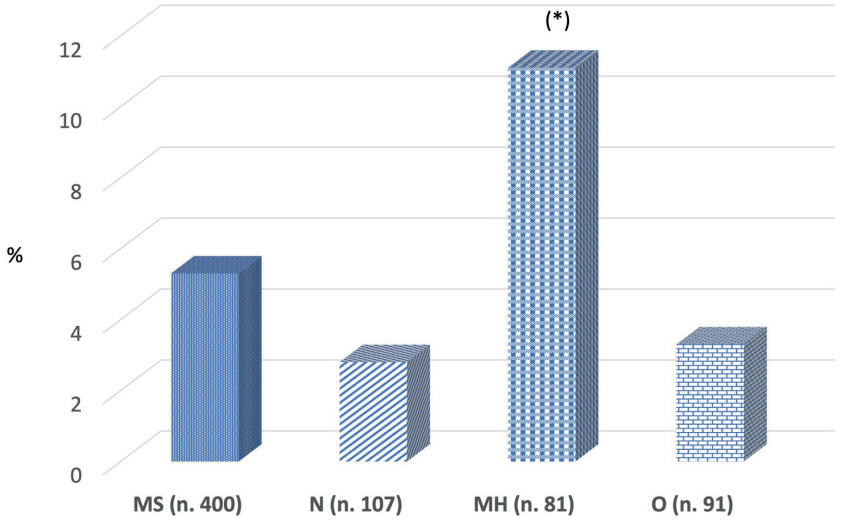

Figure 1. Prevalence of diagnosed mental disorders in study population categorized by university course attended.

MS = medicine and surgery course (n. 400), N = nursing course (n. 107), MH = mental health sector courses (n. 81), O = other courses (n. 91).

**p = 0.02.*

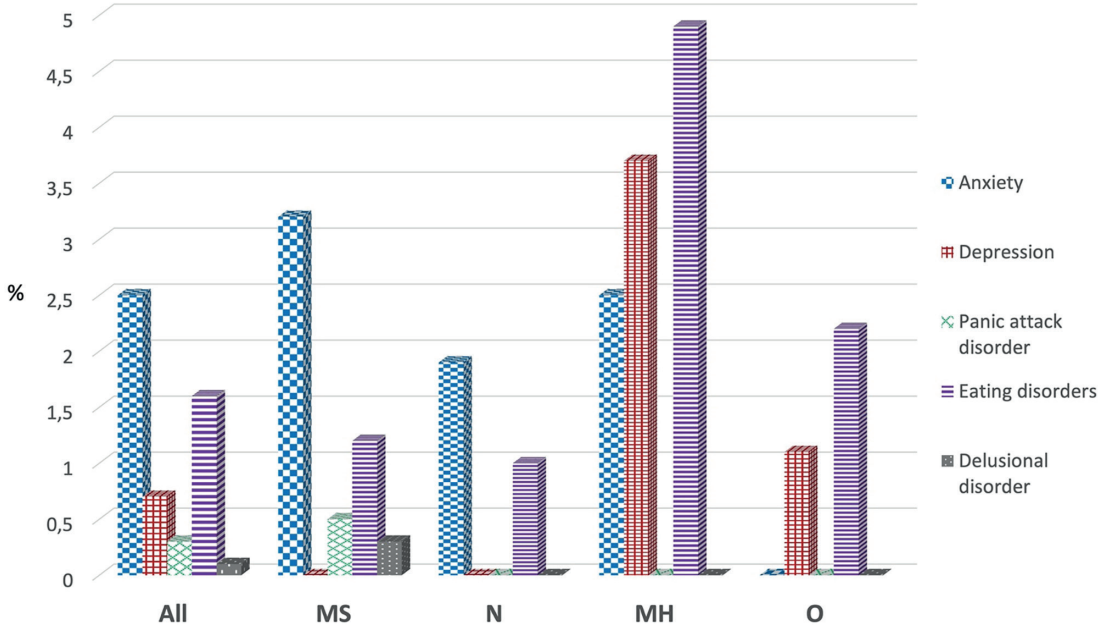

Figure 2. Prevalence of diagnosed psychiatric disease in the study population.

All = total of study population (n. 679), MS = medicine and surgery course (n. 400), N = nursing course (n. 107), MH = mental health sector courses (n. 81), O = other courses (n. 91).

workers, since from the university training period. Based on our knowledge, our study is the first in Literature to compare the prevalence of diagnosed mental illness in different groups of HS at the start of their practical training. In our study, out of 679 HS undergone to medical examination before the beginning of the Hospital practical training, 5.3% referred a diagnosed psychiatric illness at the time of the visit. Italian data [26] highlighted, for the general population with the same age range (18-34 y.o.), a prevalence of 1.3% of cases of psychiatric diseases requiring clinical evaluation during 2020; in the same survey, depression (0.3%), psychosis (0.3%) and anxiety/other neurotic syndrome (0.2%) were the most frequent diagnosis reported by 18-34 y.o. subjects undergone clinical evaluation. In our study, anxiety was the most frequent diagnosis reported (2.5% of the study population and almost half of psychiatric disease cases), while eating disorders affected 1.3% of visited students (almost one out of every three people with mental illness), and more then 10% of students with mental disease (and 0.7% of the study population) suffered from depression.

We found no research in Literature that investigated the prevalence of diagnosed psychiatric disorders in HS while several studies used standardized questionnaires to assess psychological well-being of this target population. A meta-analysis of ten cross-sectional studies, involving a total of 30,817 medical students, showed a prevalence of depression, anxiety, suicidal ideation, and eating disorders of 29%, 21%, 11%, and 2%, respectively [27]. Another study [28] assessed mental health status of college students and showed that anxiety was the prevalent psychological symptom in all groups (11.7-14.7%) followed by mood disorders (6.0-9.9%). The lack of targeted questionnaires in the assessment of psychological well-being of HS in our study could explain the lower prevalence of psychiatric discomfort in our population compared to other studies maybe because of an underestimation of cases due to the inability to recognize conditions of psychological suffering that have not yet been diagnosed and managed in a specialistic field. Our study highlighted older age in students with mental disorders compared to other students and a higher prevalence of psychiatric disease in women group than in men group. These findings are consistent with previous research works, which indicate that women have a higher prevalence of psychiatric illness than men [29, 30]. In relation to the finding of older age in our students with psychiatric disease, this data could be linked to the known effects of the underlying disorder on personal and work functioning [11]: several studies in Literature, in fact, have correlated the presence of psychological distress with delays in study path and lower academic performance [31, 32]. Concerning to the type of university course attended, in our study, a higher frequency of psychiatric disorders was found in students of MH sector than in other HS. Given the difficulty of comparing this data with the scientific Literature, lacking on this topic, we can hypothesize, based on our experience, that the Student's choice of academic course may also be influenced by their aim, on the one hand, to better understand their disorders and, on the other hand, to become able to help other people with the same kind of diseases.

In our study the Occupational Physician, after the medical examination, expressed a fit to work judgement with limitation/prescription in 16.7% of students with mental disorders compared to 1.4% of students without psychiatric disease. As previously reported, healthcare settings, characterized by high responsibility and continual exposure to suffering, illness, and death can be a demanding workplace [24]. Consequently, to manage a worker with psychiatric pathology, the Occupational Physician may need to provide a fit to work judgement with limitations or recommendations, specifically regarding working nights, workloads, responsibilities, and pace or a judgment of temporary or permanent unfitness depending on the severity of the medical condition [35]. Students attended in healthcare university courses at the start of their hospital internships made up our study population. All these students were expected to start an internship that was supervised, devoid of night shifts or direct responsibilities. Furthermore, students with psychiatric diseases involved in our study were all already taken care of by a specialist physician at the time of the visit and the specialist certified the status of good compensation for students with mental illness. For these reasons, even in presence of a psychiatric disease,

the Occupational Physician did not express an unfit to work judgement or a fit to work judgment with limitation to exposure to specific job risk in these cases. In 16.7% of students with psychiatric disease, a close monitoring schedule for follow-up visits and a close collaboration with the student's psychiatrist was established to track the development of the underlying disease throughout the student's internship.

Lastly, related to life habits, when compared with students without mental disorders, our results underlined that in students with psychiatric disease there was a higher prevalence of smoking habit, in line with data found in previous studies [18, 29]. Furthermore, unlike previous research that has linked psychiatric diseases to a higher frequency of overweight and obesity [19, 34], we discovered a substantial prevalence of underweight in our cohort of students with mental illness: this different finding could be due to the high prevalence, in our population, of eating disorders and subsequent restricted nutrition habit.

5. Conclusions

In conclusion, the high prevalence of mental disorders in our population compared to the general population, as well as the link between these disorders and unhealthy lifestyle habits, highlights the need to look at an improvement of the current health surveillance protocols that will also include an assessment of students' potential psychological fragility and subsequent effective intervention measures to support healthcare students' health and well-being (such as psychological interventions and stress management/reduction interventions).

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