

# SOMATIC SYMPTOMS AND LEVEL OF ANXIETY AND DEPRESSION IN SELF-REFERRAL PATIENTS AT THE EMERGENCY DEPARTMENT

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**A** – study design, **B** – data collection, **C** – statistical analysis, **D** – interpretation of data, **E** – manuscript preparation, **F** – literature review, **G** – sourcing of funding

## ABSTRACT

**Background:** Due to multiple morbidities, patients experience various symptoms that may be of psychogenic or somatic origin. Anxiety and depression can induce somatization and the feeling that ailments require urgent medical intervention.

**Aim of the study:** This study aimed to: (1) identify which symptoms self-referral patients most commonly report at the emergency department (ED) and which medical diagnoses they are discharged with; and (2) determine whether the type and severity of symptoms, as well as, sociodemographic variables are related to anxiety and depression levels.

**Material and methods:** The study included 110 patients who self-referred to the ED at the University Clinical Hospital in Opole. Diagnostic surveys and questionnaires were used, including the Hospital Anxiety and Depression Scale and an original questionnaire developed by the authors.

**Results:** Among those suffering from chronic diseases ( $n = 53$ ; 48.62%), 12 patients (22.64%) did not complete a single visit to the PHCF (Primary Health Care Facility), and 30 patients (56.60%) did not complete a visit to OSC (Outpatient Specialist Care) during the previous 12 months. The most common cause of reporting to the ED were pain and a burning sensation in the chest ( $n = 29$ ; 27.10%). During discharge, the most common diagnosis was "other chest pains" ( $n = 22$ ; 20.00%). 82.73% ( $n = 91$ ) of patients had clear anxiety disorders, and 68.18% ( $n = 75$ ) had clear depressive disorders.

**Conclusions:** In case of somatic symptoms without a discernible cause in patients, it is necessary to implement comprehensive measures within PHCF, such as periodic measurements of anxiety and depression severity, psychological consultation, and an in-depth medical interview. These data also suggest that proper clinical monitoring should be implemented, including clinical parameters relevant for chronic diseases and the number of visits to the PHCF and OSC.

**KEYWORDS:** hospital emergency medical services, patients, anxiety, depression

## BACKGROUND

Over the last two decades, more and more patients have been seeking help in the emergency department (ED). The phenomenon of overload of these departments may be due, in part, to demographic aging of the population, an increase in the number of people suffering from chronic diseases, organizational problems at the level of primary care, and 24-hour availability of benefits in this department [1].

Nowadays, multiple morbidity is common among aging populations around the world [2]. Markun et al. report that over 30% of ED patients have two to four coexisting diseases [3]. Sarnaki et al. report that 19–42% of the population is living with three or more coexisting diseases [4].

Due to multiple morbidity, patients experience various symptoms that may be of psychogenic or organic origin. Patients with somatoform disorders currently

constitute a particular challenge for healthcare systems. These disorders are characterized by significant distress or functional impairment associated with one or more somatic symptoms or fear of a serious illness in the absence of somatic symptoms [5]. Patients affected by somatic symptom disorder suffer mainly from subjective physical complaints, most often including headache, abdominal pain, chest pain, back/neck complaints, gastrointestinal symptoms, kidney issues, seizures, vertigo, fibromyalgia, paresthesia, visual disturbances, or amnesia [6–9]. Symptoms such as those can affect any part of the body, and can range from minor occasional problems to severe and persistent symptoms resulting in functionally impaired states [10]. In addition to the term “somatoform disorders”, researchers also use other terms, such as: functional somatic symptoms (FSS), medically unexplained symptoms (MUS), bodily distress syndromes (BDS), or somatic symptom disorder (SSD) [5].

MUS accounts for approximately 20% of new consultations in primary care and 20%–25% of all frequent attenders at medical clinics [10]. The ED is one of the services used the most by young people suffering from somatoform symptoms [11]. Alsmä et al. (2017) showed that medically unexplained physical symptoms at the ED were present in 13.4% of all visits. These patients were often younger, frequent visitors reporting on their own, had fewer medications prescribed, and suffered from a psychiatric disease more often [9,12]. Across cultures, women are more likely to report somatoform disorders than men [13]. Somatoform disorders often coexist with depression and anxiety [14]. Moreover, Spornova et al. (2019) claim that people with chronic disease show higher rates of mental health disorders, while people with mental health disorders have a greater risk of developing chronic diseases [15]. For example, in a Greek study, 19.1% of patients hospitalized with coronary disease experienced moderate depression, while 20% experienced severe depression [16]. Other researchers showed that 50% of the diabetic patients showed mild depression symptoms, with 20% showing symptoms [17]. The prevalence of clinical anxiety among COPD patients ranges between 13% and 46% [18].

It has been demonstrated that the prevalence of depression is significantly greater among patients in the ED as compared to the general population [13–14]. According to Hoyer and David, about 1 in 5 ED patients may be suffering from depression [19]. Other studies showed that the prevalence of depression among ED patients ranges from 27% to 42% [4,20]. On the other hand, anxiety most often occurs in patients experiencing pain and dyspnea [21–23]. In a study by Wells et al. (2018), 33% ED patients with pain reported anxiety [21]. Craven et al. (2013) enrolled 10,664 ED patients presenting with pain-related complaints and showed the following patient rates in terms of those reporting anxiety: 25.7%, none; 26.1%, mild; 23.7%, moderate; and 24.5%, severe [22]. Among patients with respiratory symptoms, 11% reported anxiety, 2.5% depression, and 4% reported both anxiety and depression [23].

One significant health policy challenge in many European countries at present is to develop strategies to deal with the increase in patient attendance to hospital EDs [5]. Patients with MUS may present frequently to hospital settings and receive potentially unnecessary investigations and treatments [24]. Many studies shown a strong relationship between somatization and excess healthcare costs resulting from high numbers of visits to healthcare facilities, repeated diagnostic testing, and costly treatments [8,25]. Having considered the foregoing, it is reasonable to carry out research focusing on the multiple morbidity of ED patients, concerning their somatic symptoms, as well as, anxiety and depression level in this group, in order to achieve the best possible understanding of this phenomenon.

### AIM OF THE STUDY

The present study aimed to: (1) demonstrate the chronic diseases for which ED patients are treated and the symptoms with which they most often report upon self-referral to the ED; (2) assess the level of anxiety and depression in this group; and (3) determine whether the type of symptoms, severity of symptoms, and/or sociodemographic variables determine levels of anxiety and/or depression.

### MATERIAL AND METHODS

#### Study design

A cross-sectional study was conducted in 2017. The study was started after obtaining permission from the Institutional Review Board at the Opole Medical School, No. 15/PI/2017. This study used diagnostic surveys and questionnaires. The study was carried out in accordance with the requirements of the 1975 Helsinki Declaration (as amended in 2000) and Good Clinical Practice guidelines. ED patients received questionnaires after leaving the triage office. Initially, a group of 130 patients accepted the study invitation. 110 completed surveys were returned, so the maneuverability index was 84.61%. The ICD10 nomenclature was used to establish the diagnosis with which the patient was discharged from ED. These data were obtained from CGM Clininet computer system, version 7.69.8.

#### Settings

Participants in the study were enrolled from the ED at the University Clinical Hospital in Opole.

#### Participants

110 patients, who returned completed questionnaires were qualified for the study. The study included patients who met the following criteria: over 18 years of age; reported to the ED on their own without a medical referral; reported with internal complaints (e.g., cardiovascular, respiratory, related to gastrointestinal tract)

and without trauma or without cognitive disorders; in a state of health that allowed them to complete the study questionnaires; and expressed conscious consent to participate in the study. Exclusion criteria consisted of: under 18 years of age; submitted with a medical referral or were brought in by the emergency medical team; patients who were in a general severe condition that made it impossible to carry out the study; without logical contact; with injuries, and patients who did not agree to participate in the study.

Sociodemographic characteristics of study participants is showed in Tab. 1.

Table 1. Sociodemographic characteristics of ED patients of the University Clinical Hospital in Opole.

	Trait	Value
Age [years]	M± SD	46.07±15.37
	median	43
	quartiles	34–59
Sex	Females	52 (47.27%)
	Males	58 (52.73%)
Marital status	In a relationship	82 (74.55%)
	Single	28 (25.45%)
Place of residence	Countryside	45 (40.91%)
	A city of up to 20,000 inhabitants	10 (9.09%)
	A city of 20–100,000 inhabitants	11 (10.00%)
	A city of 100,000–500,000 inhabitants	41 (37.27%)
	A city of over 500,000 inhabitants	3 (2.73%)
Education	Primary	8 (7.27%)
	Vocational	23 (20.91%)
	Secondary	38 (34.55%)
	Higher	41 (37.27%)
Status on the labor market	Employed	74 (67.27%)
	Unemployed	6 (5.45%)
	Retirees and pensioners	27 (24.55%)
	Students	3 (2.73%)
Self-reported financial situation	Very good	1 (0.91%)
	Rather good	9 (8.18%)
	Average	60 (54.55%)
	Rather poor	36 (32.73%)
	Poor	4 (3.64%)

Legend: M - mean, SD - standard deviation

## Variables

The following groups of variables have been identified:

- sociodemographic variables: age, gender, marital status, education, place of residence, labor market status, financial situation
- anxiety level, depression level, number of visits to primary healthcare facilities (PHCF) in the previous 12 months, number of visits to outpa-

tient specialist care clinics (OSC) in the previous 12 months

- type of somatic symptoms: chest pain, elevated blood pressure, abdominal pain, other symptoms with which the patients have reported to the ED
- the severity of the symptoms with which the patient reported to the ED. Symptoms were assessed on a 10-degree numerical scale, where 1 indicates weak intensity of a given symptom and 10 indicates the highest symptom intensity.

## Data sources/measurement

The research was conducted using the *Hospital Anxiety and Depression Scale* (HADS), developed by Zigmond and Snaith [26], and an original questionnaire developed by the authors.

HADS was used to investigate the severity of anxiety and depression in patients. This questionnaire is a screening tool used to detect anxiety- and depression-related disorders. The study used the Polish version of HADS – M, which is a modification of HADS adapted by Majkovicz, de Walden-Gałaszko, and Chojnacka-Szawłowska. The tool consists of two subscales – depression and anxiety. A version consisting of 14 questions was used. Of note, this version does not include an aggression measurement. The following thresholds were used to analyze the prevalence of symptoms: 0–7 points – no disorders, 8–10 points – borderline states, more than 10 points – disorders are found (high level, appropriate for the disease) [27].

An original questionnaire developed by the authors was also used. This questionnaire consisted of items concerning: sociodemographic profile of the study subjects, chronic diseases treated in patients, the number of visits to PHCF and OSC outpatient clinics in the previous 12 months, the chronic use of medicines, the type of symptoms with which the patients reported to ED and their severity.

## Statistical analyses

Statistical analyses used parametric or non-parametric tests as appropriate, depending on the departure of the variable of interest(s) from normality. Normality of variable distribution was tested using the Shapiro-Wilk test.

Comparison of the quantitative variable values in two groups was performed using Student's t-test or Mann-Whitney's test, as appropriate.

The comparison of the quantitative variable values in three and more groups was performed using ANOVA or the Kruskal-Wallis test, as appropriate.

Correlations between quantitative variables were analyzed using the Pearson's or Spearman's correlation coefficients, as appropriate. When the patient indicated more than one symptom to measure the strength of correlation between the level of anxiety and depression and the severity of symptoms, the calculations only included the symptom severity that was rated as the highest by the patient. The strength of

the relationship was interpreted according to the following scheme:  $|r| \geq 0.9$  – very strong relationship,  $0.7 \leq |r| < 0.9$  – strong relationship,  $0.5 \leq |r| < 0.7$  – moderately strong relationship,  $0.3 \leq |r| < 0.5$  – weak relationship,  $|r| < 0.3$  – very weak relationship (i.e., negligible) [28].

If a patient reported several symptoms, the symptom with the greatest severity was taken into account to investigate the relationship between HADS and the severity of the symptoms that the patient reported with to ED.

Analyses assumed a significance level of 0.05. Analyses was performed in R software, version 3.6.1 [29].

## RESULTS

Chronic diseases of the subjects, symptoms with which patients most often reported upon self-referral to the ED, and medical diagnoses on the discharge report

Fifty-three (48.62%) survey respondents had chronic diseases, and 48 people (44.86%) took medication on a continuous basis because of these diseases. Self-referred ED patients were treated most often due to such coexisting diseases, such as: arterial hypertension (30; 56.60%), atrial fibrillation and flutter (10; 18.87%), thyroid disease (8; 15.09%), ischemic heart disease (6; 11.32%), and bronchial asthma (6; 11.32%) (Tab. 2).

Table 2. Chronic diseases in the study group.

Chronic diseases*	n	percentage
Arterial hypertension	30	56.60%
Atrial fibrillation and flutter	10	18.87%
Thyroid diseases	8	15.09%
Ischemic heart disease	6	11.32%
Bronchial asthma	6	11.32%
Atherosclerosis	5	9.43%
Gastrointestinal reflux	5	9.43%
Heart insufficiency	4	7.55%
Osteoarthritis	4	7.55%
Insulin-dependent diabetes	4	7.55%
Angina pectoris	3	5.66%
Urolithiasis	3	5.66%
Heart valve defects	2	3.77%
Osteoporosis	2	3.77%
Digestive ulcer	2	3.77%
Cholelithiasis	2	3.77%
Aneurysms	1	1.89%
Chronic obstructive pulmonary disease	1	1.89%
Bronchial dilatation	1	1.89%
Rheumatoid arthritis	1	1.89%
Chronic kidney failure	1	1.89%
Glomerulonephritis	1	1.89%
Adrenal insufficiency	1	1.89%

Legend: \* - patients could indicate more than one chronic disease

Out of all the respondents, 41 patients (37.27%) reported visiting the PHCF facility in the previous 12 months, and a group of 23 patients (20.91%) had follow-ups concerning their chronic diseases in OSC at that time (Tab. 3). Among those suffering from chronic diseases, 12 people (22.64%) did not have a single visit to PHCF and 30 (56.60%) did not visit OSC at that time.

Table 3. Visits in the last 12 months due to chronic diseases in primary and specialist outpatient clinics.

Number of visits	N	%
Visits to a primary healthcare facility (PHCF)		
No visits	69	62.73%
1–3 visits	21	19.09%
4–6 visits	10	9.09%
7 visits and more	10	9.09%
Total	110	100.00%
Visits to a specialist doctor in an outpatient specialist care outpatient clinic (OSC)		
No visits	87	79.09%
1 visit	5	4.55%
2 visits	6	5.45%
3 visits	8	7.27%
4 visits	4	3.64%
Total	110	100.00%

The symptoms that were the most common cause of the report were: pain, chest burning (29; 27.10%), abdominal pain (26; 24.30%), high arterial blood pressure (17; 15.89%), palpitations (9; 8.41%), general malaise (7; 6.54%), headaches (4; 3.74%), dyspnea (3; 2.80%), diarrhea (3; 2.80%), fever above 38 degrees C – (3; 2.80%), coughing (2; 1.87%), vomiting (2; 1.87%), weakness, fatigue (1; 0.93%), and other symptoms (1; 0.93%).

The most common diagnoses made during the discharge from the ED were: other chest pain (R07.3) – 22 persons (20.00%), essential (primary) hypertension (I10) – 15 persons (13.64%), pain localized to upper abdomen including epigastric (R10.4) – 10 persons (9.09%), cardiac arrhythmia, unspecified (I49) – 6 (5.45%), functional dyspepsia (K30) – 6 (5.45%), and malaise and fatigue (R53) – 4 (3.64%) (Tab. 4).

## Anxiety and depression levels and their determinants

Sten score analysis showed that 82.73% (91) of survey respondents had clear anxiety disorders (11–21 points in the HADS questionnaire), 14.55% (16) had borderline anxiety (8–10 points), whereas only 2.73% (3 persons) had no disorders (0–7 points).

The median intensity of depression was 11 points (min – max; 4–20 points). 68.18% (n = 75) of ED patients had a clear depressive disorder (11–21 points) and 30.00% (n = 33) had borderline depressive disorders (8–10 points). Only 1.82% (2 people) did not have depressive disorders (0–7 points).

There was no significant correlation between the age of patients and the severity of anxiety ( $r_s = 0.051$ ,

Table 4. Medical diagnoses according to the ICD – 10 placed on patients upon discharge from the ED.

Diagnosis according to ICD – 10	n	Per-centage
Other chest pain (R07.3)	22	20.00%
Essential (primary) hypertension (I10)	15	13.64%
Pain localized to upper abdomen. Incl.: Epigastric (R10.4)	10	9.09%
Cardiac arrhythmia, unspecified (I49)	6	5.45%
Functional dyspepsia (K30)	6	5.45%
Malaise and fatigue (R53)	4	3.64%
Angina pectoris, unspecified (I20.9)	4	3.64%
Unspecified renal colic (N23)	4	3.64%
Other and unspecified allergy (T78.4)	3	2.73%
Neuralgia and neuritis, unspecified [intercostal neuralgia] (M79.2)	3	2.73%
Hypertension (I10)	3	2.73%
Acute pharyngitis, unspecified [upper respiratory tract infection] (J02.9)	3	2.73%
Other disorders of electrolyte and fluid balance, not elsewhere classified (E87.8)	3	2.73%
Urinary tract infection, site not specified (N39.0)	3	2.73%
Congestive heart failure [acute chronic heart failure] (I50.0)	2	1.82%
Other soft tissue disorders, not elsewhere classified [soft tissue diseases related to overload] (M79)	2	1.82%
Gastritis (R29.7)	2	1.82%
Other viral enteritis [intestinal rhinitis] (A08.3)	2	1.82%
Acute biliary pancreatitis (K85)	1	0.91%
Intestinal colic (K92)	1	0.91%
Pneumonia, unspecified organism (J18.9)	1	0.91%
Bronchitis (J20)	1	0.91%
Pancreatitis (K85)	1	0.91%
Constipation (K59.0)	1	0.91%
Laryngitis (J04.0)	1	0.91%
Suspected perforation of the large intestine diverticulum (K63.1)	1	0.91%
Upper gastrointestinal bleeding (R04)	1	0.91%
Syncope (R55)	1	0.91%
Other unspecified headaches (G44.8)	1	0.91%
Dizziness (R42)	1	0.91%
Myocardial infarction (I21)	1	0.91%
Total	110	100.00%

p=0.599). Moreover, no correlation was found between the severity of anxiety and sex (p=0.287), marital status (p=0.167), place of residence (p=0.754), education (p=0.589), employment status (p=0.290) and financial situation of respondents (p=0.263) (Tab. 5).

The level of depressive disorders depended significantly only on the professional activity of the subjects. In particular, depression level was higher in subjects who did not work (Me= 12, min – max; 11–14) as compared to professionally active subjects (Me= 11, min – max; 10–12) (p<0.001). The other sociodemographic variables were not related to the severity of depressive disorders (Tab. 6).

Table 5. Analysis of the relationship between qualitative demographic variables and the intensity of anxiety.

Trait	HADS – anxiety [score]			p *	
	M±SD	median	Quar-tiles		
Sex	Females (N=52)	13.15±3.16	13.5	10-15.25	0.287 P
	Males (N=58)	13.74±2.59	14	12-16	
Marital status	In relationship (N=82)	13.68±2.85	14	12-16	0.167 NP
	Single (N=28)	12.82±2.89	13	10.75-15	
Place of residence	Countryside (N=45)	13.8±2.53	14	12-16	0.754 NP
	City of up to 100,000 inhabitants (N=21)	13.43±2.98	14	12-15	
	City of more than 100,000 inhabitants. (N=44)	13.14±3.17	14	10.75-16	
Education	Primary, Vocational (N=31)	13.84±2.98	15	12.5-16	0.589 NP
	Secondary (N=38)	13.34±2.58	14	12-15	
	Higher (N=41)	13.29±3.09	13	11-15	
Employment status	Professionally active (N=77)	13.27±2.92	14	12-15	0.290 P
	Professionally inactive (N=33)	13.91±2.77	15	13-16	
Financial situation	Very good. Rather good. (N=10)	13.6±2.59	14	12.25-15.5	0.263 P
	Average (N=60)	13.83±2.73	14	12-16	
	Rather poor or poor (N=40)	12.88±3.11	13	10-15	

Legend: \* P = Normal distribution in groups, Student t-test (for comparison of 2 groups) or ANOVA (for >2 groups); NP = No normal distribution in groups, Mann-Whitney test (for 2 groups) or Kruskal-Wallis test (for >2 groups), M – mean, SD – standard deviation.

Table 6. Analysis of the relationship between qualitative demographic variables and the severity of depression.

Trait	HADS - depression [score]			p *	
	M±SD	median	Quar-tiles		
Sex	Females (N=52)	11.69±2.59	12	10-13	0.567 NP
	Males (N=58)	11.47±2.23	11	10-13	
Marital status	In relationship (N=82)	11.49±2.42	11	10-13	0.581 NP
	Single (N=28)	11.82±2.36	12	10-13	
Place of residence	Countryside (N=45)	11.6±2.24	12	10-13	0.999 NP
	City of up to 100,000 inhabitants (N=21)	11.48±1.4	11	11-12	
	City of more than 100,000 inhabitants. (N=44)	11.59±2.92	11	10-13	
Education	Primary, Vocational (N=31)	12.35±2.74	12	11-13	0.139 NP
	Secondary (N=38)	11.61±2.03	12	10-13	
	Higher (N=41)	10.95±2.31	11	10-12	
Employment status	Professionally active (N=77)	11.03±2.1	11	10-12	<0.001 NP
	Professionally inactive (N=33)	12.85±2.6	12	11-14	
Self – reported financial situation	Very good. Rather good. (N=10)	11.1±3	10	9-12.75	0.359 NP
	Average (N=60)	11.7±1.92	12	10.75-13	
	Rather poor. Poor. (N=40)	11.5±2.89	11	10-13	

Legend: \* P = Normal distribution in groups, Student t-test (for comparison of 2 groups) or ANOVA (for >2 groups); NP = No normal distribution in groups, Mann-Whitney test (for 2 groups) or Kruskal-Wallis test (for >2 groups), M – mean, SD – standard deviation.

There were no significant relationships between the severity of symptoms reported by patients upon self-referral to the ED, and their anxiety level ( $r_s=0.107$ ,  $p=0.265$ ). There was also no significant association between the severity of symptoms and the level of depression ( $r_s=0.008$ ,  $p=0.933$ ).

The mean level of severity of anxiety in patients with chest pain was  $13.1\pm 2.5$ ;  $13.53\pm 3.69$  in patients with high blood pressure;  $13.35\pm 3.19$  in patients with abdominal pain; and  $13.79\pm 2.58$  in patients with other symptoms. Severity of anxiety was not correlated with reporting to the ED due to chest pain, high blood pressure, abdominal pain, or other symptoms ( $p=0.807$ ).

The median intensity of depression in the group of patients reporting to the ED due to chest pain was 12 (min-max; 10-13), 13 (min-max; 11-13) in patients with high BP, 11 (min-max; 9.25-12) in patients with abdominal pain, and 11 (min-max 10-13) in patients with other symptoms. There was no significant correlation between the severity of depression and reporting to ED due to the foregoing symptoms ( $p=0.142$ ) (Tab. 7).

## DISCUSSION

### Key results

Nearly half of the self-referred ED patients were treated due to chronic diseases. Some of the chronically ill patients did not have a single visit to the PHCF or OSC in the previous 12 months. The most frequent reasons for reporting to the ED were symptoms such as pain, burning sensation in the chest, stomachache, high blood pressure, and palpitations. The vast majority of the survey respondents had clear an anxiety or depressive disorder. None of the sociodemographic variables were associated with anxiety levels among patients. The level of depressive disorders was shown to differ based on the professional activity of the respondents, only.

### Interpretation

#### Chronic diseases and patient symptoms among patients who self-referred to the ED

In our sample of 53 patients, patients indicated they had different chronic diseases 73 times. Thus, each

patient reported suffering from more than one disease, on average. The respondents were most often affected by chronic diseases, such as: hypertension, atrial fibrillation and flutter, thyroid diseases, ischemic heart disease, and bronchial asthma. In a study by Dikme et al., 63% of patients indicated the presence of at least one coexisting disease [30]. Markun et al. demonstrated that 27.7% of patients reporting the simultaneous presence of 5-7 diseases, while 26.5% reported the presence of 8-10 diseases [3]. Of note, nearly half of the patients in their study with multiple morbidities were between the ages of 60 and 79 years [3]. In the present study, we found that of the patients with chronic diseases, 12 (22.64%) did not have a single visit to the PHCF and 30 (56.60%) did not visit OSC in the previous 12 months. Lack of reporting to OSC may result from the long waiting time for guaranteed services in Poland. According to the Watch Health Care Foundation (WHC) Barometer as of December/January 2019, the mean waiting time for a single guaranteed health service in Poland is 3.8 months. Long waiting times mainly concern OSC services. Patients encounter waiting lists for many months trying to schedule a visit to a specialist, a basic diagnostic examination, or a surgery [31]. However, it is difficult to explain the lack of visits of chronically ill patients to a PHCF doctor, as the availability of PHCF is assessed positively by the majority of Polish people (68%) [32]. Therefore, the reasons why patients with chronic diseases do not report to PHCFs require further investigation.

#### Anxiety and depression and their determinants

According to the World Health Organization (WHO), over 300 million people around the world suffer from depression and 264 million suffer from anxiety disorders [33]. Fogarty et al. also report that anxiety and depression are the two most common mood disorders, with a prevalence of 26.7% and 23.2%, respectively [34]. The results of our study showed that 82.73% ( $n = 91$ ) of survey respondents had clear an anxiety disorder and 14.55% ( $n = 16$ ) had a borderline case of an anxiety disorder. In addition, as many as 68.18% ( $n = 75$ ) of patients had a clear depressive disorder, and 30.00% ( $n = 33$ ) of patients had a borderline case of a depressive disorder. In Saudi Arabia, anxiety and depression were

Table 7. The level of severity of anxiety and depression and the type of symptoms that patients reported to ED.

HADS		Pain, burning sensation in the chest (N=29)	High blood Pressure (N=17)	Stomachache (N=26)	Other (N=38)	P *
Anxiety	M±SD	13.1±2.5	13.53±3.69	13.35±3.19	13.79±2.58	0.807 P
	Median	13	14	14	14	
	quartiles	11-15	11-16	12-15.75	12-16	
Depression	M±SD	11.86±2.29	12.41±2.53	10.92±2.08	11.42±2.56	0.142 NP
	Median	12	13	11	11	
	quartiles	10-13	11-13	9.25-12	10-13	

Legend: \* P = Normal distribution in groups, ANOVA; NP = No normal distribution in groups, Kruskal-Wallis test, M - mean, SD - standard deviation.

observed in 27.2% and 23.0% of ED patients, respectively [35]. In a study conducted among ED patients in the USA, 33% of ED patients with pain reported anxiety [21]. In a study by Craven et al (2013), 48% of patients described moderate to severe anxiety at ED presentation [22]. Abar et al. showed that depression was relatively common in a sample of ED patients, with mean values in the “mild depression” range and 18% of patients reporting at least “moderate depression” [7]. As we can see, our own results concerning the prevalence of anxiety and depression among ED patients are much higher than those obtained by other authors. Such a large difference in percentages between our own study and the above-mentioned studies can be explained, in part, by the criteria for patient selection for the study sample; that is, our study sample consisted only of self-referred ED patients, whereas previous studies examined self-referred patients as well as surgically-referred patients. Further studies are needed to test the hypothesis that self-referred ED patients experience anxiety more frequently as compared to patients reporting to the surgical part of the ED. For example, further studies should be conducted on a larger test sample, in several EDs, and using other tools to measure anxiety and depression levels.

The presence of disease symptoms or the co-existence of other diseases in addition to the underlying disease may be associated with patient’s anxiety concerning his or her condition. An analysis conducted by Nowicka-Sauer et al. in a group of patients with chronic diseases shows significantly higher levels of anxiety as compared to depression (i.e., 7 vs. 4 points in the HADS questionnaire). According to the authors, the disease most predisposing to the anxiety disorder presence was systemic lupus, with 55.6% of patients with lupus reporting anxiety. In contrast, anxiety symptoms were reported by 50% of patients with RA, 31.4% of patients with myocardial infarction, and 20% of patients with stroke [36].

The literature shows that patients with a diagnosis of group F-45 in the ICD 10 classification (‘somatic disorders’) are often diagnosed with coexisting diseases such as anxiety disorders and depression. A study by Leutgeb et al. compared the percentage of pain symptoms in two study groups: “F-45 patients” and “non-F45-patients”. They found that back pain was present in 4.99% of patients with a diagnosis of F-45 and 3.29% without such diagnosis. Similarly, abdominal pain was present in 4.56% vs. 2.97%, and throat and chest pain in 1.58% vs. 0.99% [5]. On the other hand, Abar et al. observed somatization among patients with depression and anxiety disorders in the form of chest pain (16% for depression and 23% for anxiety) and abdominal pain (14% for depression and 23% for anxiety) [7]. A study in Brazil reports that chest pain in patients reporting to ED is correlated with anxiety (33.9%) and depression (30.5%) [37]. Similar results were reported in a study from India, wherein depressive and anxiety disorders in patients reporting to ED for chest pain were iden-

tified in 23% [38]. In our study, there were no significant correlations between the severity of anxiety and reporting to ED due to chest pain, high blood pressure, abdominal pain, or other symptoms ( $p=0.807$ ). There was also no significant correlation between the severity of depression level and reporting to ED due to the foregoing symptoms.

Patients may interpret their ailments as requiring a visit to ED because of their perceived anxiety [30]. Many patients with somatic symptoms are frequently subjected to invasive diagnostic tests; however, psychological factors are not sufficiently analyzed [39]. Shindhaye et al. suggest a strong association between somatoform disorders and depression/anxiety (with odds ratios ranging from 2.5–3.5) [13]. Research by Hsia and Niedźwiecki shows that mood disorders such as anxiety and depression were diagnosed in 6.8% of non-urgent ED visits, i.e. those which were not caused by the patient’s health- or life-threatening condition and did not require tests and diagnostics [40]. According to Lubszczyk et al., 28.37% of patients in the ED seek help because of cardiovascular problems, and 18.86% seek help because of symptoms and abnormal test results [41]. It is worth noting that many researchers associate the presence of non-cardiac chest pain with somatization of anxiety and depression. In our study, 27.10% of survey respondents reported to the ED due to chest pain, and 20% were subsequently discharged from the ED with a diagnosis of “other chest pains” (R07.3 according to ICD-10). As mentioned by Croicu & Chwiastiak, somatization can occur among patients with chronic medical conditions, such as cardiovascular disease or chronic obstructive pulmonary disease [39].

One of the aims of the present study was to determine whether sociodemographic variables determine the level of anxiety and depression. The level of depressive disorders in our study varied significantly only on the professional activity of the respondents; with higher levels of depression reported in inactive patients relative to active ones. This result may have been due to the relatively limited number of patients who qualified for this study. However, in our study, severity of anxiety was not significantly correlated with age, sex, marital status, place of residence, employment status, nor self-reported financial situation of the respondents. In a study by Salsberry et al., anxiety disorders were reported in 80% (48) of women and 20% (12) of men, and the age group from 45 to 54 years old was the most numerous for this diagnosis [42]. In a study by Dark et al., women constituted 62% of anxiety-related ED visits compared with all-cause ED visits, with visits related to anxiety disorders being more frequent in non-urban areas [43]. A study by Weiss et al. also did not find a significant correlation between sociodemographic variables (such as sex and age) and the presence of mood disorders. Indeed, according to Weiss et al., the number of visits to the ED that were associated with depression, anxiety, and acute responses to stress increased by 49.7% among both women and

men across the years 2006–2013 [44]. However, a relationship between the incidence of mood disorders and gender was not reported in a study by Fogarty et al., in which patients were divided according to the type of mental disorder they had. In the category of depressive disorders, women constituted 24.5% of the surveyed population, compared to 21.2% of men. In the category of anxiety disorders, in contrast, woman constituted 19.8% of the surveyed population as compared to 21.3% of men [34]. Uchmanowicz and Gobbens who conducted studies in a population of individuals over 60 years of age using the HADS scale. The researchers found relatively high levels of anxiety and depression, with levels at 9.5 and 8.8, respectively [45].

The level of depressive disorders in the present study depended significantly only on the professional activity of the respondents, with higher levels reported in the inactive patients as compared to the active ones. The other sociodemographic variables did not differentiate the level of depressive disorders. In the aforementioned study by Nowicka-Sauer, the level of depression and anxiety among women than men (i.e., 5 vs. 4 points for depression and 8 vs. 5.5 points for anxiety, respectively) [36].

Patients with anxiety and depression may perceive their health in a different way than medical personnel. Dikme et al. analyzed the assessment of condition severity made by the patients themselves and also by doctors. 14.1% of respondents described their condition as “not very serious” (38.5% according to doctors), 39.7% as “not serious” (32.7%), 27.9% as “normal” (26%), 15.8% as “serious” (2.7%), and 2.5% as “very serious” (0.1%). Among patients classified as “not serious” by ED doctors, 96.7% were discharged, while 37.5% of patients classified as “serious” were discharged. Also, the study by Dikme et al. found that 17.6% of respondents believed that their condition required hospital admission [30]. These data suggest a subjective approach to the patient as early as at the level of outpatient care, and highlights the critical need to identify the influence of mental factors on the general condition of the patient [46]. At the level of this care, any barriers to access to health services (e.g., care for a sick family member, lack of transport means, shame of the disease) should be determined and help should be provided to eliminate these barriers [7]. This allows for a quicker diagnosis of mental problems to prevent potential consequences, such as job loss, or financial and family problems [39].

### Generalizability

The study examined the prevalence of anxiety and depression among self-referred ED patients and found high levels of these disorders. These data suggest that, in case of somatic symptoms in patients with no apparent cause, the patient’s history should be broadened each time with questions about the occurrence of severe stress, anxiety symptoms, and deteriorating mood. We recommend the use of tools that can assist with

diagnosing the most common mental disorders, such as the Patient Health Questionnaire (PHQ) – 9 or the Generalized Anxiety Disorder (GAD-7). These questionnaires show a high level of sensitivity, and can allow medical providers to determine the risk of their occurrence as early as the patient’s first visit, which is important for the context of a primary healthcare physician’s office [47].

### LIMITATIONS OF THE STUDY

The study was limited by focusing on only one ED and a relatively small group of patients. The latter limitation resulted from the fact that not all patients met the inclusion criteria during the observation period. Therefore, the results have limited generalizability to a wider population. Another limitation of the study was the use of only one standardized tool to measure levels of anxiety and depression. In the future, other tools should be used, such as the Beck Depression Inventory, the Spielberger State Anxiety Inventory (SSAI), and the Trait (STAI) Anxiety Inventory [48,49].

### CONCLUSIONS

1. Self-referred ED patients most often report due to thoracic pain and/or a burning sensation. During discharge, these patients are most often diagnosed with “other chest pains.” In addition, nearly half of the patients were diagnosed with chronic diseases, and most patients had clear anxiety or depression disorder. Taken together, these data suggest that comprehensive measures should be taken for this group of patients at the primary healthcare level.
2. In case of a patient’s somatic symptoms without an apparent cause, we suggest that: (1) the PHCF physician should broaden the interview with questions about the presence of severe stress, anxiety symptoms, and mood deterioration; (2) trained PHCF nurses should periodically assess the severity of anxiety and depression using standardized tools; and (3) the patient should be referred for psychological consultation. Only the results of all the foregoing actions should form the basis for a PHCF doctor to make further therapeutic decisions concerning the patient (e.g., extension of diagnostics, psychiatric consultation, psychotherapy).
3. Self-referred ED patients with various somatic symptoms and who do not work may demonstrate high levels of depressive disorders. The ED doctor should take this potential risk into account when making a diagnosis. Moreover, after discharge from the ED, in addition to the implementation of appropriate treatment for such patients, it is recommended that the doctor coordinates actions between the PHCF facility and social services, as patients may require social support.



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