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Epidemiology

Somatic symptoms and associations with common psychological diagnoses: a retrospective cohort study from Norwegian urban general practice

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Abstract

Background: Patients with mental health problems often present with somatic symptoms when visiting their general practitioner (GP). Somatic presentations may challenge correct diagnosing of mental health disorders in general practice, where most of these disorders are treated.
Objective: Explore the associations between common psychological diagnoses and somatic symptom diagnoses in Norwegian urban general practice.
Methods: A retrospective cohort study including electronic medical data from 15 750 patients aged 16–65 years from 35 GPs in six GP offices in Oslo, Norway, during 12 months in 2014–2015. We explored prevalences and associations between anxiety-, depression-, and stress-related diagnoses, and somatic symptom diagnoses.
Results: Patients with anxiety-, depression- and stress-related diagnoses had a mean number of 2.9±3.6 somatic symptom diagnoses during the 12 months, compared to 1.9±2.5 for patients without any psychological diagnoses ($P < 0.001$). The mean number of somatic symptoms was significantly higher for the different psychological diagnoses viewed separately, for both sexes and different age groups. There was an increase in probability for anxiety, depression, or stress-related diagnoses with an increasing number of somatic symptom diagnoses during the 12 months. We found a significant increase in somatic symptom diagnoses from ICPC-2 chapters: General and unspecified, digestive, cardiovascular, musculoskeletal, neurological, urological, female genital disorders and social problems. Associated symptom patterns were different for each of the included psychological diagnoses.
Conclusions: This study shows that patients with anxiety, depression- and stress-related diagnoses present with increased and characteristic somatic symptoms compared to patients without these diagnoses in general practice.

Lay summary

Patients in general practice often present with diffuse and unexplained symptoms that are not always easily separated into mental or physical categories. In this study, we found that

Key Messages

- Anxiety was associated with digestive, musculoskeletal and urological symptoms.
- Depression was associated with digestive, and musculoskeletal symptoms.
- Acute stress was associated with musculoskeletal, urinary and menstrual symptoms.
- PTSD was associated with musculoskeletal and neurological symptoms.
- Increasing somatic symptoms increased the probability of psychological diagnoses.

patients with anxiety-, depression- and stress-related diagnoses have more bodily symptoms than patients without these diagnoses. We observed different bodily symptom patterns for the various psychological diagnoses included in this study. Also, we found a higher risk of having a psychological diagnosis with increasing bodily symptoms.

Key words: Anxiety, depression, general practice, psychological stress, PTSD, somatic symptoms

Introduction

Patients in general practice often present with diffuse and unexplained symptoms that do not follow the body–mind division that characterizes the classifications of disease used in the health care system today (1). This makes general practice the ideal environment for exploring patients' undifferentiated symptoms and disease patterns, which could readily fit both somatic and mental categories (1).

Many general practitioners (GPs) perceive somatic symptoms as possible presentations of social or emotional distress (2), and generally find common symptoms and complaints meaningful to deal with (3). Still, somatic symptom presentations may present a challenge for diagnosing mental health disorders in general practice (4). A WHO study from primary health care in 14 countries found that 69% of patients fulfilling criteria for depression reported only somatic symptoms as the reason for their doctors' visit (5).

Extensive evidence suggests that mental health disorders are associated with somatic symptoms (6–8). This association seems to be bidirectional, with an undecided theory of causation (9). Some studies focus on mental health issues as precursors to somatic symptoms (10). Other studies have the opposite focus: That having somatic symptoms may increase the risk of developing mental health issues (11). Some studies focus on shared etiological factors that may independently cause the onset of mental health disorders and somatic health problems (12,13).

Most of the literature on the association of mental and somatic health problems in general practice focus on depression (14,15). There are fewer studies on anxiety and somatic symptoms in primary care settings (16), but some studies from the general population (17,18).

There is sparse literature on symptoms of stress and somatic symptoms in general practice. A Swedish study looked at the prevalence of perceived stress and associations with anxiety and depression in patients seeking primary care and found that two-thirds of the patients expressed increased stress levels, indicating a high degree of burnout (19). Another Swedish study looked at somatic symptoms among patients referred from primary health care or occupational health service centers for stress-related exhaustion. They found that 98% reported at least one somatic symptom, and 45% reported six symptoms or more (20).

Post-traumatic stress disorder (PTSD) is well known to be associated with somatic health problems (21), and this condition seems to be underdiagnosed in general practice (22). This condition has traditionally been seen in patients with severe traumatic life events, but studies show that non-traumatic life events can also generate PTSD symptoms (23). A systematic review on prevalence, detection and correlates of PTSD in primary care from 2016 found increased levels of somatic health problems among patients with PTSD (24).

This study aims to explore associations between depression-, anxiety- and stress-related diagnoses, and somatic symptom diagnoses in general practice. We seek to investigate the prevalence of somatic symptom diagnoses in patients with or without common psychological diagnoses, whether a higher burden of somatic symptom diagnoses increases the probability of having a psychological diagnosis, and how individual somatic symptom diagnoses correlate with depression-, anxiety- and stress-related diagnoses.

Methods

Design and setting

A retrospective cohort study, collecting data from six GP offices with 35 participating GPs from the boroughs of Grorud, Stovner, and Alna in Oslo, Norway. The recruitment of GPs was part of a more extensive cluster-randomized controlled study, Shared Care and Usual Health Care for Mental and Comorbid Health Problems (25). Descriptive characteristics regarding the participating patients, GPs and the mean number of visits are described in a previous publication (26).

Data collection

Data was collected in 2015 and included electronic medical records for all patients with registered contact with their GP 12 months retrospectively. Data from all patients aged 16–65 years were included. Data from all registered patient contacts were extracted, comprising consultations, home visits, phone calls, letters, prescriptions, or interdisciplinary meetings. There were no exclusion criteria. Variables extracted were age, sex, date of contact, type of contact, registered diagnoses and reimbursement codes.

Diagnostic codes

Norway has a primary care system where 99% of the population is listed with a regular GP, and less than 2% of the population trade their GP during a year (27). The GPs are funded through a government-aided tariff system, and registered contacts require a diagnostic code for the medical contact to be valid for reimbursement. The International Classification of Primary Care, 2nd edition

(ICPC-2) is the diagnostic coding system used in Norwegian general practice (28). ICPC-2 divides into chapters that cover medicine at large. The diagnostic codes consist of one letter and two digits. The letter indicates an organ system. The numbers 00–29 indicate symptom diagnoses, while 70–99 indicate disease diagnoses, although with some overlap. Although ICPC-2 was designed to capture both patient's reasons for encounter, primary care interventions and data ordering in an episode-of-care structure, these potentials are not utilized to a full extent today. The journal-systems require the GPs to insert the diagnostic codes relevant to each individual contact into their electronic medical records. There are no specific requirements for the duration of health issues before a diagnosis can be made. This is decided at the discretion of the GP.

Psychological diagnoses

The psychological diagnosis chapter in ICPC-2 aims to be a comprehensive collection of mental health problems presented in general practice, ranging from symptoms such as a reduced sexual desire to severe disorders such as schizophrenia. We focused on the most significant types of mental health problems based on the most commonly occurring diagnoses in our data set (26). These included anxiety-, depression- and stress-related diagnoses. The description of these ICPC-two diagnoses and their corresponding International Classification of Disease, 10th edition (ICD-10) diagnoses are described in more detail in Online Table 1 (29).

Somatic symptoms diagnoses

Somatic symptom diagnoses refer to all the symptom diagnoses (-00-29) from each ICPC-2 organ chapter. Additionally, we have included diagnoses representing functional syndromes or symptom clusters commonly associated with mental health disorders in the literature (30). These diagnoses comprise; stomach function disorder, irritable bowel syndrome, vertiginous syndrome, elevated blood pressure, neck syndrome, back syndrome w/o radiating pain, back syndrome with radiating pain, shoulder syndrome, tension headache and hyperventilation syndrome. The description of these ICPC-2 diagnoses and their corresponding ICD-10 diagnoses are described in more detail in Online Table 1.

Table 1 *Number of somatic symptom diagnoses for 15 750 patients aged 16–65 years in Norwegian general practice, stratified by patients with selected psychological diagnoses,[a] sex and age groups (2014–2015)*

	Total	Sex		Age groups (years)		
	N = 15 750	Women *n* = 9089	Men *n* = 6661	16–30 *n* = 4505	31–50 *n* = 7083	51–65 *n* = 4162
Patients without psychological diagnoses, total						
N	13 683	7698	5985	4028	6044	3611
S diagnoses, mean (SD)	1.9 (2.5)	2.1 (2.6)	1.5 (2.3)	1.6 (2.1)	2.0 (2.7)	1.9 (2.6)
Patients with psychological diagnoses, total[b]						
N	2067	1391	676	477	1039	551
S diagnoses, mean (SD)	2.9 (3.6)	3.1 (3.6)	2.4 (3.3)	2.2 (2.9)	3.1 (3.8)	3.0 (3.6)
P-value	**<0.0001**	**<0.0001**	**<0.0001**	**<0.0001**	**<0.0001**	**<0.0001**
Feeling anxious/nervous/tense						
N	208	138	70	56	88	64
S diagnoses, mean (SD)	3.2 (3.7)	3.5 (3.9)	2.4 (3.3)	2.4 (3.2)	3.5 (4.0)	3.3 (3.8)
P-value	**<0.0001**	**<0.0001**	**0.003**	**0.005**	**<0.0001**	**<0.0001**
Acute stress reaction						
N	621	463	158	156	336	129
S diagnoses, mean (SD)	2.9 (3.7)	3.0 (3.6)	2.6 (4.0)	2.1 (2.3)	3.0 (3.8)	3.7 (4.5)
P-value	**<0.0001**	**<0.0001**	**<0.0001**	**0.030**	**<0.0001**	**<0.0001**
Feeling depressed						
N	249	164	85	72	117	60
S diagnoses, mean (SD)	3.2 (3.4)	3.5 (3.7)	2.6 (2.8)	2.6 (3.4)	3.2 (3.4)	3.8 (3.3)
P-value	**<0.0001**	**<0.0001**	**0.0002**	**0.0002**	**<0.0001**	**<0.0001**
Anxiety disorder						
N	352	227	125	84	176	92
S diagnoses, mean (SD)	2.8 (3.6)	3.1 (3.4)	2.4 (4.0)	2.0 (2.5)	3.0 (4.1)	3.2 (3.6)
P-value	**<0.0001**	**<0.0001**	**0.0003**	**0.106**	**<0.0001**	**<0.0001**
Depressive disorder						
N	914	611	303	192	460	262
S diagnoses, mean (SD)	2.8 (3.5)	3.2 (3.8)	2.0 (2.5)	2.3 (3.1)	3.1 (3.7)	2.8 (3.3)
P-value	**<0.0001**	**<0.0001**	**0.007**	**<0.0001**	**<0.0001**	**<0.0001**
Post-traumatic stress disorder						
N	118	59	59	11	73	34
S diagnoses, mean (SD)	3.1 (3.2)	3.6 (3.4)	2.5 (3.0)	2.6 (2.1)	3.6 (3.4)	2.1 (2.8)
P-value	**<0.0001**	**<0.0001**	**0.002**	**0.118**	**<0.0001**	**0.695**

The *P*-values were calculated by a generalized linear mixed model adjusting for cluster effect on center-level. The patients without a psychological diagnosis served as a reference for each selected psychological diagnosis group. Bold values denote statistical significance at the $P < 0.05$ level.

ICPC-2, The International Classification of Primary Care, 2nd edition; SD, standard deviation.

[a] P-diagnoses includes the ICPC-2 diagnoses P01, P02, P03, P74, P76, P82.

[b] A total of 2067 patients were registered with at least one of the six selected P-diagnoses. As some were registered with more than one P-diagnosis, the six groups' sum is higher (*n* = 2462) than the number of patients.

Data analyses

Numbers were presented as frequencies and percentages or means and standard deviations (SD) as appropriate. Generalized linear mixed models with random effects for centre adjusting for possible cluster effect due to the hierarchical structure in the data were estimated to perform the following analyses. The number of somatic symptom diagnoses (S-diagnoses) between the patients with and without any psychological diagnosis (P-diagnosis) was compared. Differences between patients with and without individual P-diagnoses were also assessed. This analysis was performed for all patients and stratified by sex and age groups (16–30, 31–50 and 51–65 years). The differences in the occurrence of S-diagnoses from different organ chapters and individual most prevalent diagnoses (present among at least 1% of patients with any of the included P-diagnoses), S-diagnoses between those with and without (any and individual) P-diagnoses were assessed. The association between the number of S-diagnoses and the probability for P-diagnosis was tested, and the results were illustrated graphically as probabilities with corresponding 95% confidence intervals (CI).

Statistical analyses were performed by SPSS v26 and SAS v9.4. All tests were two-sided. Benjamini–Hochberg procedure was applied to control the false discovery rate due to multiple testing. The *P*-values indicating significant results after this adjustment are enhanced with bold-face.

Results

Study sample

During the 12 months, 16 845 patients conducted 66 814 consultations with a GP, either in-office or home visits. The remaining contacts were either phone calls, letters, prescriptions, or interdisciplinary meetings and not included. A total of 560 patients received anxiety-related diagnoses, 1163 patients received depression-related diagnoses and 739 patients received stress-related diagnoses. There were 1095 patients with other psychological diagnoses, therefore not included, and 13 683 patients without any psychological diagnoses during the year. This resulted in 15 750 patients included in this study, of them 9089 women and 6661 men.

Distribution of somatic symptom diagnoses in patients with or without psychological diagnoses

The somatic symptom distribution ranged from one diagnosis in 4841 (29%) patients to 36 different diagnoses in one patient during the 12 months. Patients with a psychological diagnosis had a higher number of somatic symptoms with a mean (SD) of 2.9 ± 3.6 diagnoses, compared to 1.9 ± 2.5 for patients without any psychological diagnosis during the 12 months ($P < 0.001$) as presented in Table 1. We found a significant increase in the mean number of somatic symptom diagnoses for each psychological diagnosis viewed independently for both sexes and most age groups.

The probability for at least one psychological diagnosis increased significantly ($P < 0.0001$) with an increasing number of somatic symptoms. This probability was significantly different from zero already from one somatic symptom diagnosis during the 12 months. When the number exceeds 26, the probability for at least one psychological diagnosis was significantly higher than 0.5 and kept increasing (Fig. 1).

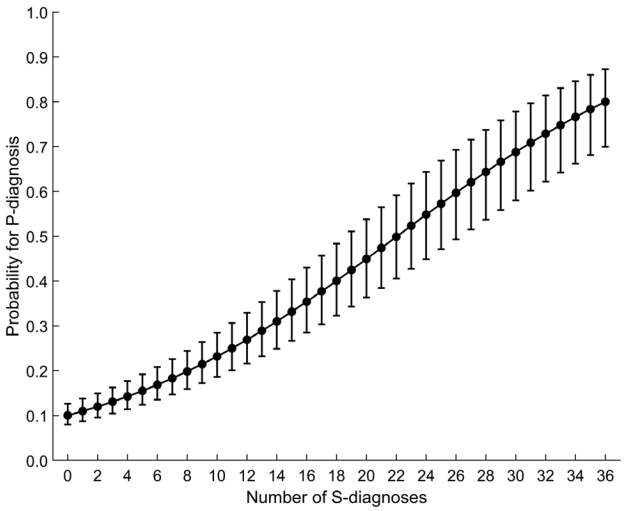

Figure 1 Probability for having anxiety-, depression- or stress-related diagnoses with an increasing number of somatic symptom diagnoses in 15 750 patients aged 16–65 years in Norwegian general practice from 2014 to 2015 (95% CI)

Somatic symptom diagnoses associated with psychological diagnoses

Table 2 shows the distribution of the most common somatic diagnostic codes stratified by patients with or without a psychological diagnosis, defined as diagnoses occurring in one percent or more of the psychological diagnoses group. Online Table 2 shows the complete list of the most commonly occurring individual diagnostic codes, whereas Table 2 shows only those with a significant difference between the two groups. Online Table 3 shows the association between the different psychological diagnoses and the different diagnostic chapters of the ICPC-2 classification system. Here, we see a significant increase in social problem–diagnoses for several of the psychological diagnoses. These are not represented in Table 2 or Online Table 3 as they occur in less than one percent of patients with psychological diagnoses overall.

Discussion

In this present study, we found a significant increase in somatic symptom diagnoses for any of the included psychological diagnoses, for both sexes and most age groups, compared to their corresponding group of patients without any psychological diagnoses. This is, to our knowledge, the first study to address individual psychological diagnoses and association with individual somatic symptoms in general practice and the first study to distinguish between psychological symptoms and disorders.

We found that the youngest age group showed a lesser increase in somatic symptoms than the other age groups. This was somewhat unexpected, as we know that adolescents also tend to present to their GP with somatic symptoms when they suffer from mental health problems (31). Their general health and functioning may be better due to their age; however, there are limitations when studying diagnoses alone. We know that mental health disorders tend to be underdiagnosed in general practice for all patients, especially young adults (31). Very few patients in this age group were diagnosed with PTSD, too few to find significant results.

We found an even increase in probability for having a psychological diagnosis through an increasing number of somatic symptom

Table 2. Distribution of diagnoses significantly associated with patients having a psychological diagnosis[a] in 15 750 patients aged 16–65 years from Norwegian general practice (2014–2015)

ICPC-2 Diagnoses *n* (%) *P*-value	Total *N* = 15750	Without psychological diagnosis *n* = 13683	With psychological diagnosis *n* = 2067	Feeling anxiety *n* = 208	Acute stress reaction *n* = 621	Feeling depressed *n* = 249	Anxiety disorder *n* = 352	Depressive disorder *n* = 914	PTSD *n* = 118
General weakness/ tiredness	946 (6.0)	752 (5.5)	194 (9.4) **<0.0001**	13 (6.3) 0.531	88 (14.2) **<0.0001**	30 (12.0) **<0.0001**	34 (9.7) **0.0006**	78 (8.5) **<0.0001**	5 (4.2) 0.575
General disease NOS	354 (2.2)	280 (2.0)	74 (3.6) **<0.0001**	8 (3.8) 0.057	16 (2.6) 0.583	14 (5.6) **0.0005**	18 (5.1) **0.0002**	28 (3.1) 0.017	4 (3.4) 0.274
General abdominal pain/cramps	749 (4.8)	596 (4.4)	153 (7.4) **<0.0001**	19 (9.1) **0.008**	43 (6.9) 0.022	22 (8.9) **0.010**	27 (7.7) **0.010**	76 (8.3) **<0.0001**	12 (10.2) **0.007**
Nausea	111 (0.7)	89 (0.7)	22 (1.1) 0.043	0 0.984	4 (0.6) 0.985	7 (2.8) **0.0002**	4 (1.1) 0.274	9 (1.0) 0.234	0 0.985
Constipation	116 (0.7)	85 (0.6)	31 (1.5) **0.0001**	3 (1.4) 0.194	9 (1.4) 0.034	8 (3.2) **<0.0001**	4 (1.1) 0.274	14 (1.5) **0.004**	1 (0.8) 0.804
Eye symptom/complaint	207 (1.3)	175 (1.3)	32 (1.5) 0.645	8 (3.8) **0.008**	11 (1.8) 0.433	1 (0.4) 0.188	2 (0.6) 0.216	15 (1.6) 0.704	3 (2.5) 0.313
Palpitations/awareness of heart	138 (0.9)	104 (0.8)	34 (1.6) **0.0001**	6 (2,9) **0.001**	6 (1.0) 0.556	3 (1.2) 0.420	5 (1.4) 0.172	18 (2.0) **0.0003**	2 (1.7) 0.261
Neck symptom/complaint	675 (4.3)	553 (4.0)	122 (5.9) **0.0007**	9 (4.3) 0.969	35 (5.6) 0.215	20 (8.0) **0.010**	21 (6.0) 0.099	60 (6.6) **0.0005**	5 (4.2) 0.975
Back symptom/complaint	834 (5.3)	698 (5.1)	136 (6.6) **0.004**	20 (9.6) **0.002**	47 (7.6) 0.028	10 (4.0) 0.529	21 (6.0) 0.316	58 (6.3) 0.058	7 (5.9) 0.642
Shoulder symptom/ complaint	590 (3.7)	500 (3.7)	90 (4.4) 0.164	7 (3.4) 0.801	32 (5.2) 0.230	14 (5.6) 0.183	9 (2.6) 0.260	52 (5.7) **0.0009**	2 (1.7) 0.264
Leg/thigh symptom/ complaint	222 (1.4)	189 (1.4)	33 (1.6) 0.528	2 (1.0) 0.572	9 (1.4) 0.868	10 (4.0) **0.003**	5(1.4) 0.993	12 (1.3) 0.901	1 (0.8) 0,612
Knee symptom/complaint	735 (4.1)	630 (4.6)	105 (5.1) 0.414	6 (2.9) 0.242	26 (4.2) 0.468	17 (6.8) 0.115	14 (4.0) 0.563	50 (5.5) 0.231	12 (10.2) **0.006**
Foot/toe symptom/ complaint	448 (2.8)	372 (2.7)	76 (3.7) 0.022	8 (3.8) 0.338	32 (5.2) **0.001**	7 (2,8) 0.979	8 (2.3) 0.587	32 (3.5) 0.179	2 (1.7) 0.490
Muscle pain	555 (3.5)	424 (3.1)	131 (6.3) **<0.0001**	15 (7.2) **0.002**	34 (5.5) **0.005**	10 (4.0) 0.395	22 (6.3) **0.001**	61 (6.7) **<0.0001**	10 (8.5) **0.002**
Back syndrome w/o radiating pain	424 (2.7)	355 (2.6)	69 (3.3) 0.083	8 (3.8) 0.335	17 (2.7) 0.834	14 (5.6) **0.003**	12 (3.4) 0.364	29 (3.2) 0.409	4 (3.4) 0.654
Shoulder syndrome	531 (3.4)	453 (3.3)	78 (3.8) 0.266	6 (2.9) 0.739	25 (4.0) 0.303	7 (2.8) 0.684	19 (5.4) 0.033	34 (3.7) 0.525	9 (7.6) **0.012**
Headache	610 (3.9)	492 (3.6)	118 (5.7) **<0.0001**	12 (5.8) 0.133	50 (8.1) **<0.0001**	15 (16.0) 0.069	22 (6.3) **0.013**	38 (4.2) 0.451	7 (5.9) 0.199
Vertigo/dizziness	431 (2.7)	355 (2.6)	76 (3.7) **0.008**	8 (3.8) 0.279	23 (3.7) 0.142	8 (3.2) 0.569	16 (4.5) 0.029	36 (3.9) 0.020	3 (2.5) 0.954
Tension headache	101 (0.6)	80 (0.6)	21 (1.0) 0.023	3 (1.4) 0.085	8 (1.3) 0.043	2 (0.8) 0.463	3 (0.9) 0.440	7 (0.8) 0.471	3 (2.5) **0.011**
Shortness of breath/ dyspnoea	153 (1.0)	121 (0.9)	32 (1.5) **0.005**	8 (3.8) **<0.0001**	10 (1.6) 0.067	6 (2.4) 0.016	3 (0.9) 0.949	12 (1.3) 0.190	1 (0.8) 0.966
Urine incontinence	86 (0.5)	60 (0.4)	26 (1.3) **<0.0001**	4 (1.9) **0.004**	9 (1.4) **0.0007**	3 (1.2) 0.083	5 (1,4) **0.011**	8 (0.9) 0.065	2 (1.7) 0.059
Menstruation irregular/ frequent	120 (0.8)	91 (0.7)	29 (1.4) **0.001**	3 (1.4) 0.206	11 (1.8) **0.003**	0 0.984	3 (0.9) 0.697	16 (1.8) **0.0008**	0 0.992
Breast symptom/ complaint	127 (0.8)	103 (0.8)	24 (1.2) 0.072	1 (0.5) 0.594	15 (2.4) **<0.0001**	2 (0.8) 0.993	2 (0.6) 0.658	8 (0.9) 0.836	1 (0.8) 0.943

The *P*-values were calculated by generalized linear mixed model adjusting for cluster effect on center-level. The patients without a P-diagnosis served as a reference for each selected P-group. Bold values denote statistical significance at the $P < 0.05$ level.

ICPC-2, The International Classification of Primary Care, 2nd edition; NOS, not otherwise specified; PTSD, post-traumatic stress disorder.

[a] P-diagnoses include the ICPC-2 diagnoses P01, P02, P03, P74, P76, P82.

diagnoses, which is in line with previous knowledge (32,33). We did not find any clear cut-off points. Somatic symptoms in general practice are so common (34) that GPs will have difficulties finding patients with undisclosed mental health problems based on the number of symptom diagnoses alone.

The diagnosis of fatigue was significantly increased for several different psychological diagnoses, which corresponds well with previous findings (8). Several psychological diagnoses were associated with diagnoses of digestive health problems, although nausea and constipation were only associated with depressive disorders and not

anxiety disorders. A Norwegian population study from 2002 found the opposite results: nausea and constipation were more strongly associated with anxiety disorders than depressive disorders (35).

Urinary incontinence was only associated with anxiety and not with depression. A previous Norwegian population study found that urinary incontinence was associated with both anxiety and depression (36).

Strengths and limitations

The Norwegian government-aided tariff system, which makes the coding of ICPC-2-codes per contact fundamental, strengthens the data's comprehensiveness and diagnostic coding specificity. The GP office centers were recruited from Groruddalen in Oslo, a group of suburbs in an urban setting with a high number of first- or second-generation immigrants and general low socio-economic features. These elements will affect the generalizability of the study population. We only included patients from 16 to 65 years, excluding children and older adults/seniors. The rationale was that older patients and children would have features specific to their age groups, and we focused on adolescents and adult patients in this study.

This present study addresses associations and diagnostic patterns in a comprehensive group of GP patients during 12 months in general practice. It does not address causality issues nor chronological elements. There are several uncertainties associated with studying diagnoses in general practice. We know mental health disorders tend to be underdiagnosed (37). It often depends on how patients present their ailments to their doctor (5,38). We know that patients often raise several issues during a consultation (39), and we do not know how many of these issues would register with a diagnosis during the consultation. Although, a Norwegian study found that diagnoses in medical records correspond well with the content of consultations (40).

Conclusions

This study shows that patients with anxiety-, depression- and stress-related diagnoses present with increased and characteristic somatic symptoms compared to patients without these diagnoses in general practice. Increased knowledge on how different mental health symptoms and disorders present in general practice is essential. General practice can be an ideal environment to study the complex inter-relationship between somatic and psychological symptoms to better detect and treat mental health disorders in patients presenting with mixed symptoms and undisclosed mental health issues.

Supplementary material

Supplementary material is available at *Family Practice* online.

Declarations

Ethical approval: The project was approved by the Regional Committee on Medical and Health Research Ethics Health Region South East (reg.no 2014/435), by the National Committee on Medical and Health Research Ethics (reg.no 2014/160), and by the Data Protection Officer at Akershus University Hospital, Oslo (reg. no 13/138).

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Conflicts of interest: No potential conflict of interest was reported by the author(s).

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