From the biomedical to the biopsychosocial model: the implementation of a Stepped and Collaborative Care Model in Swiss general hospitals

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“A new type of thinking is essential if mankind is to survive and move toward higher levels”, Albert Einstein

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Summary

Background and objectives

International and national initiatives like the Sustainable Development Goals and the National Strategy on the Prevention of non-communicable diseases aim to reduce the burden of mental health. Early detection of mental health conditions is thus, a major priority of public health. Stepped and Collaborative Care Models (SCCMs) offer an opportunity to early detect and appropriately treat mental health conditions in vulnerable populations, fostering integrated care. This thesis focuses on a SCCM that aims to implement a routine psychosocial distress assessment and offers appropriate treatment to distressed hospital patients. However, integration of mental health services into somatic settings was seen to be challenging in other settings, e.g., primary care. Evidence for patients with mental–somatic multimorbidities in hospital settings is scarce.

Thus, the main objectives of this thesis were to assess the integration of mental health services and to assess implementation of a SCCM into general hospitals in Basel-Stadt, Switzerland (Objectives 1 and 2). The unforeseen coronavirus disease 2019 (COVID-19) pandemic additionally triggered further research questions. We investigated the association between COVID-19 restrictions and mental health of non-COVID-19 hospital patients (Objective 3). Additionally, we explored an alternative method to monitor mental health consequences of the COVID-19 pandemic, the use of Big Data (Objective 4).

Methods

This thesis focuses on a SCCM implemented in four hospitals, three of which were included in the studies presented here: the University Hospital Basel, the University Department of Geriatric Medicine FELIX PLATTER, and the Bethesda Hospital. Including three hospitals differing in structure and focus allowed us to get a broader view of possible facilitators and barriers to the integration of mental health and the implementation of the SCCM. We conducted qualitative interviews with physicians and nurses operating the SCCM at the hospital before (N = 18) and after (N = 18) the implementation of the SCCM. Additionally, we used quantitative data of 873 patients on COVID-19 distress, mental health consequences, and social support collected during periods with different COVID-19 restriction levels, using multiple regression models. The last objective was presented as an opinion paper, highlighting advantages and disadvantages of Big Data based on literature.

Results

Before the SCCM was implemented in hospital settings in Basel, Switzerland, healthcare professionals perceived mental–somatic multimorbidities to be relevant due to their high perceived frequency (Objective 1). Mental health dimensions had, however, a low priority due to suboptimal environments, suboptimal interprofessional collaboration, existing stigma among healthcare professionals and patients, lack of mental health knowledge, and the strong emphasis on somatic diseases. Particularly physicians reported the low priority of mental health, also due to historical views focusing on biomedical aspects and time constraints.

Afterwards, we assessed facilitators and barriers of implementing the first step of the SCCM (Objective 2). The first step of the SCCM is a psychosocial distress assessment of patients through healthcare professionals. Healthcare professionals highlighted the importance of integrating the assessment into preexisting hospital workflows and IT

systems. Being able to adapt certain workflows to the needs of the different wards and hospitals was key to adherence and thus, to the sustainability of the SCCM.

Still, structural and social barriers to the implementation of the psychosocial distress assessment were emphasized. Hospitals are characterized by a strong focus on somatic diseases with tight working routines. Adding additional tasks like the mental health assessment constituted a challenge. Besides the strong emphasis on somatic diseases and the time constraints, lack of knowledge, awareness, and familiarity and subjectivity of the mental health assessment were impeding the efforts towards integrated care. This, partially, is also caused by the high turnover rate of physicians.

The implementation of the SCCM described herewas accompanied by the COVID-19 pandemic. The Swiss government set different COVID-19 restrictions depending on COVID-19 case numbers, hospitalizations, and deaths. Thus, we investigated the association between the COVID-19 restrictions and the COVID-19-related distress, mental health consequences, and social support (Objective 3). Multiple regression analyses of non-COVID-19 patients during different levels of COVID-19 restrictions indicated that hospital patients were more distressed related to leisure time and loneliness when stronger COVID-19 restrictions were in place. Surprisingly, this did not result in increased mental health consequences or changes in social support.

Another approach to monitor mental health of the general population or subgroups like hospital patients could be Big Data, such as social media or routine hospital data (Objective 4). These may help to tailor appropriate interventions to populations at risk of mental health consequences. Applying Big Data should always consider ethical and legal concerns to protect privacy and data. Particularly, transparency regarding data analysis may prevent these concerns.

Conclusion

This thesis adds evidence to the integration of mental health and implementation of a SCCM to hospital settings in Switzerland. Structural and social challenges, such as missing knowledge and awareness, strong emphasis on somatic diseases, time constraints, suboptimal environment, suboptimal interprofessional collaboration, and stigma were emphasized by healthcare professionals. To overcome these challenges, hospitals and policy makers need to think about changes in the healthcare system. For instance, task shifts, new roles, and new processes are needed in the hospital setting to better achieve integrated care.

Hospitals are built to care for patients in acute medical situations. Patients with mental–somatic multimorbidities, however, need continuous and long-term care. Certain patient groups (e.g., cancer patients, transplantation patients) receive this care within hospitals. Other patient groups rely on treatment outside hospital. Strong networks between services within and outside hospitals are, thus, essential to guarantee continuity of care.

Overall, the current healthcare system with its strong biomedical focus needs to adapt to the increasing number of patients with chronic diseases, including mental–somatic multimorbidities. This system change could be achieved through learning health systems, where interprofessional and interdisciplinary work is a high priority. Continuously collected data supports the adaptation of the healthcare system to the current needs and evidence base. Thus, the change from the biomedical to the biopsychosocial model may be strengthened.

Common abbreviations

APN	Advanced Practice Nurse
CL service	Consultation and liaison service
COREQ-32	32-item Consolidated Criteria for Reporting Qualitative Research
COVID-19	Coronavirus disease 2019
DALYs	Disability Adjusted Life Years
EKNZ	Ethikkommission Nordwest- und Zentralschweiz (Ethics Committee of Northwest and Central Switzerland)
ERIC	Expert Recommendation for Implementing Change
FTE	Full-time equivalent
GAD-7	7-item General Anxiety Disorders questionnaire
ICD-10	International Classification of Diseases and Related Health Problems, Tenth revision
IT	Information technology
ITS	Interrupted time series
KOF	Konjunkturforschungsstelle (Swiss Economic Institute)
LHS	Learning Health System
MCS	Mental component summary
NCD	Non-communicable disease
OSSS-3	3-item Oslo Social Support Scale
PHQ-8	8-item Patient Health Questionnaire
PGV	Prävention in der Gesundheitsversorgung = prevention in health services

SCCM	Stepped and collaborative care model
SD	Standard deviation
SDG	Sustainable Development Goals
SF-36v1	36-item Short Form, version 1
SLHS	Swiss Learning Health System
SomPsyNet	Comprehensive healthcare project for patients from SOMatic hospitals that promotes the prevention of PSYchosocial distress by establishing a stepped and collaborative care NETwork in Basel, Switzerland
SSD-12	12-item Somatic Symptom Disorder questionnaire
SSS-8	8-item Somatic Symptom Severity questionnaire
UK	United Kingdom
US	United States
YLDs	Years Lives with Disability

CHAPTER 1
Introduction

INTRODUCTION

Prince et al. (2007) stated that there is "no health without mental health". The bidirectional pathway of somatic and mental health and frequently observed mental–somatic multimorbidity ask for a holistic approach in health care (Beutel and Schulz, 2011, Prince et al., 2007). However, the biomedical model focusing on biological diseases is still prominent (Wade and Halligan, 2017), although Engel postulated already in 1977 that it had reached its limitations (Engel, 1977). His main argument was that medicine should take psychological, social, and cultural factors influencing the onset and course of a disease into account (Engel, 1977). The high prevalence of mental–somatic multimorbities supports this argument (Tuch, 2018). Particularly when keeping the consequences on morbidity and mortality of mental–somatic multimorbidities in mind (Beutel and Schulz, 2011, Prince et al., 2007). An integrated approach proposed by the biopsychosocial model may improve mental and somatic health of patients, and thus, reduce the global burden of disease. Hence, this thesis focuses on the integration of mental health services and the implementation of a new service model, a Stepped and Collaborative Care Model (SCCM), in general hospitals. This SCCM aims at better integrating mental health services into a somatic setting.

MENTAL HEALTH EPIDEMIOLOGY

Mental health and its burden

Good mental health, an integral part of health and well-being, allows coping with normal stress (World Health Organization, 2018, World Health Organization, 2021). Several determinants can impede mental health: social, cultural, economic, political, and environmental factors (Alegría et al., 2018, Allen et al., 2014). In cancer patients, this kind of stress is called psychosocial distress, where the patients are no longer able to cope with their cancer (PDQ Supportive and Palliative Care Editorial, 2021). This concept of psychosocial distress is not restricted to cancer patients, but applies to patients with other

chronic diseases, such as cardiovascular disease or irritable bowel disease, as well (Choung et al., 2009, Hermens et al., 2014). These patients display mental health consequences from normal adjustment issues to mental disorders, such as major depressive disorder (PDQ Supportive and Palliative Care Editorial, 2021). Although the mechanisms are not yet clear, it is suspected that psychosocial distress, if not treated, can lead to depression or anxiety (Drapeau et al., 2012), two mental disorders classified by the International Classification of Diseases and Related Health Problems, Tenth revision (ICD-10) (World Health Organization, 2021).

In 2019, mental disorders accounted for 4.9% of the global burden of disease (GBD 2019 Mental Disorders Collaborators, 2022). Most of the Disability Adjusted Life Years (DALYs) for mental health are due to Years Lived with Disability (YLDs). In total, 14.6% of global YLDs were related to mental disorders (GBD 2019 Mental Disorders Collaborators, 2022). The burden of mental disorders in Switzerland and its neighboring countries remained high over the past decades (Figure 1.1). Depressive and anxiety disorders belonged to the leading mental disorders (GBD 2019 Mental Disorders Collaborators, 2022). 38.2% of the population in the European Union (including Switzerland) suffered from mental disorders in 2010 (Wittchen et al., 2011). It is possible that the coronavirus disease 2019 (COVID-19) pandemic increased this burden (GBD 2019 Mental Disorders Collaborators, 2022).

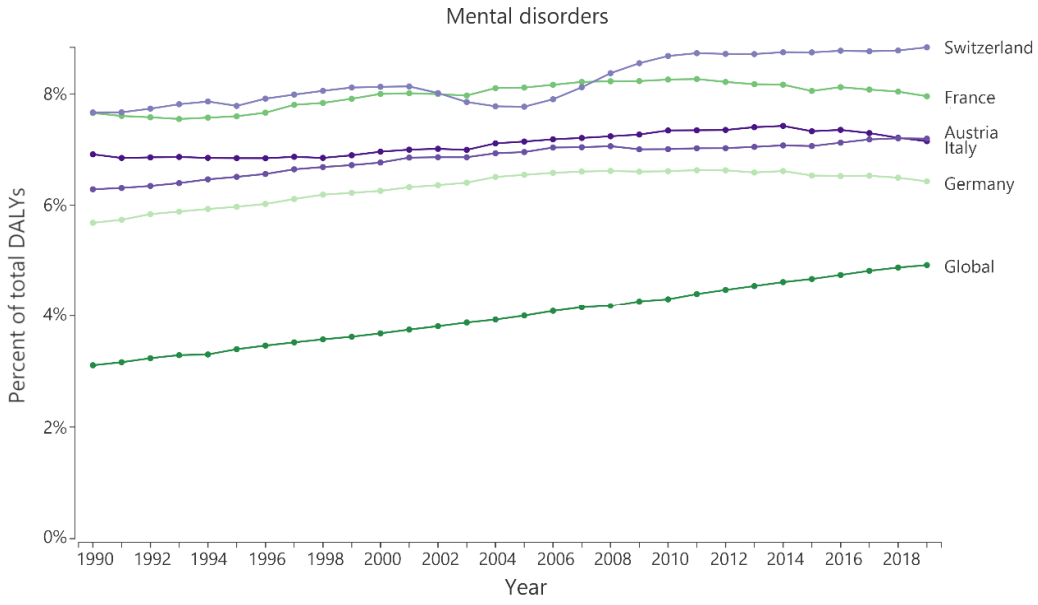

Figure 1.1 Percentage of total DALYs due to mental disorders in Switzerland, its neighboring countries, and globally based on the Global Burden of Disease (GBD) Compare Data Visualization (Institute for Health Metrics and Evaluation (IHME), 2020)

Mental health and the COVID-19 pandemic

In the general population of various European countries including Switzerland, mental disorders, such as depression and anxiety, increased during the first wave of the COVID-19 pandemic (Bräscher et al., 2021, Cénat et al., 2021, Fancourt et al., 2021, Santomauro et al., 2021b), as observed in previous epidemics like Severe Acute Respiratory Syndrome (SARS), Ebola, or Middle East Respirators Syndrome (MERS) (Esterwood and Saeed, 2020). This increase was even higher than expected by models based on data collected between 2014 and 2019 (Pierce et al., 2020). Studies from the Netherlands and Denmark observed either small or no changes in mental health during the first wave of the COVID-19 pandemic (Bonenkamp et al., 2021, Petersen et al., 2021). However, repeated cross-sectional and longitudinal studies from Germany and the United Kingdom (UK) showed that mental disorders increased after the lockdown was announced, and decreased subsequently when the COVID-19 restrictions were eased in 2020 (Bräscher et al., 2021, Fancourt et al., 2021). This trajectory was observed in the general population globally

(Richter et al., 2021) and in German patients with pre-existing mental disorders (Bartels et al., 2021).

Only few studies explored the impact of COVID-19 on people with chronic diseases (Kuper and Shakespeare, 2021) and evidence on non-COVID-19 hospital patients is lacking. Most of the few studies, however, show an increase in mental health burden (Feter et al., 2021, Louvardi et al., 2020, Smith et al., 2020, Steptoe and Di Gessa, 2021). Others reported either no association between the chronic disease and higher symptoms of mental disorders during the COVID-19 pandemic or increased distress without an increase in health-related quality of life (Budu et al., 2021, Wehrle et al., 2020). Further, a qualitative study in the UK reported that people with long-term somatic health conditions were afraid of COVID-19 and not receiving healthcare they needed (Fisher et al., 2021). Thus, assessing mental health of non-COVID-19 hospital patients sheds light to the impact the COVID-19 pandemic had on this vulnerable population.

Mental–somatic multimorbidities in general hospitals

In Switzerland, the prevalence of hospital patients with a diagnosed mental disorder in addition to a somatic disease was 11.4% (Tuch, 2018). In other countries, prevalence of mental–somatic multimorbidities goes up to 60% (IsHak et al., 2017, Rose et al., 2011, Walker et al., 2014). However, mental disorders in somatic patients remain often undetected and untreated (Beutel and Schulz, 2011, Olariu et al., 2015, Rettke et al., 2020, Rose et al., 2011).

Treatment is important to prevent mental–somatic multimorbidities. Patients with mental–somatic multimorbidities are more often admitted to hospital, re-hospitalized, and their hospital stays were longer (Aubert et al., 2019, Beeler et al., 2020, Prina et al., 2015, Rose et al., 2011, Tuch, 2018). Additionally, patients with mental–somatic multimorbidities less often adhered to recommended treatment, increasing the morbidity and mortality (Beutel and Schulz, 2011). Taken together, all these factors increase the healthcare costs of patients with mental–somatic multimorbidities compared to patients

with a somatic disease only (Hochlehnert et al., 2011). Although these consequences underline the importance of adequately detecting and treating mental disorders in somatic patients, data on mental health in hospital settings is scarce and not up-to-date (Walker et al., 2018).

MENTAL HEALTH CARE IN HOSPITAL SETTINGS

Integrated care models

Different integrated care models focusing on various levels exist: Individual models (e.g. case managers), group- and disease-specific models (e.g., chronic care models), and population-based models (e.g., Kaiser Permanente) (World Health Organization, 2016). Although there is no unique definition for integrated care, all models aim to center the needs of individuals, their families, and communities (World Health Organization, 2016). The models are heterogeneous, because no model fits all patient groups and needs (Baxter et al., 2018). Integrated care models were seen to increase patient satisfaction, perceived quality of care, and patient access to services (Baxter et al., 2018). To reach this, patient engagement, multiprofessional/multidisciplinary working culture, evidence-based pathways, and continuous monitoring to improve performance are key for successful integrated models (Mitchell et al., 2015, World Health Organization, 2016). Additionally, social services need to be taken into account, particularly when implementing mental health into general medical care (McGinty and Daumit, 2020). The number of initiatives focusing on integrated care is increasing, also in Switzerland (Schusselé Filliettaz et al., 2018). These integrated care models are mostly focusing on primary care and not hospital settings. However, one approach to integrate care at hospital settings is the consultation and liaison (CL) service.

Consultation and liaison services

In most general hospitals in Switzerland, CL services are available (Berney and Jenewein, 2020). Physicians in general hospitals can ask the CL service for advice on handling and treatment of patients with psychosocial issues (Lipowski, 1971). Thus, CL services act as mediators between somatic wards and mental health specialists (Lipowski, 1971). In some hospitals psychiatric and psychosomatic CL services are separated while in others they are combined into one CL service (Berney and Jenewein, 2020). Although psychosomatic medicine and CL psychiatry were introduced to the psychiatric training curriculum in 1985 (Georgescu and Berney, 2011) and CL services were offered for decades, especially in University hospitals (Caduff and Georgescu, 2004), CL psychiatry was only declared a subspecialty of adult psychiatry in 2008 (Georgescu, 2009). This was followed by CL training launched in 2010 (Georgescu and Berney, 2011).

Still, barriers of CL services exist. While psychiatrists asked for stronger participation in patient treatment (Caduff and Georgescu, 2004), physicians on somatic wards insufficiently refer patients to these services (Huyse et al., 2001, Innes et al., 2014). The latter may be related to psychosocial issues remaining undetected. One possible approach is the proactive CL service implemented in the Netherlands, the US, and the UK (Oldham et al., 2019, Sharpe et al., 2020). In proactive CL services, patients are routinely assessed through the CL service, increasing the resources (Oldham et al., 2019). Screenings could reduce these resources, guarantee a holistic assessment of patient, following the biopsychosocial model, and enhance the recognition of mental–somatic multimorbidities.

Recognition of mental disorders

There are major deficiencies related to the recognition of mental disorders through healthcare professionals and patients. Similar symptoms of somatic and mental health diseases may cause insufficient recognition of mental disorders (Alonso et al., 2018). The recognition rates of depression and anxiety in primary care (Cepoiu et al., 2008, Craven

and Bland, 2013, Kamphuis et al., 2012, Mitchell et al., 2009, Olariu et al., 2015) and non-psychiatric hospitals (Cepoiu et al., 2008, Rentsch et al., 2007, Wancata et al., 2000) are low. This may lead to insufficient treatment, even in particularly vulnerable patient groups, such as cancer patients (Walker et al., 2014), also because patients do not recognize the need for treatment (Thornicroft et al., 2017). Therefore, routine screening is recommended (Walker et al., 2018).

Stepped and collaborative care

In primary care, the National Institute for Health and Care Excellence (NICE) guidelines in the United Kingdom recommend stepped care to treat mental disorders of people aged 18 and over (National Collaborating Centre for Mental Health, 2011). First, healthcare professionals from primary care have to determine the severity of the mental disorder. Depending on the patient's history and his/her preferences, a suitable treatment is offered. According to the guideline, the mental health specialist chooses the least invasive but most effective treatment first. After a certain time, the mental disorder is newly assessed and the treatment is adapted accordingly. Adequate treatment involves several intensities, from psychoeducation and active monitoring to self-help groups and antidepressant medication. To implement such a model in hospital care, close collaboration with healthcare providers outside the hospital setting is necessary.

Evidence suggests mixed results of stepped care (Maehder et al., 2019, van Straten et al., 2015). Although psychological symptoms improved, smaller effects were observed in some chronic somatic conditions (Maehder et al., 2019). This may be related to the high investment needed and the related low uptake (van Beljouw et al., 2014). Still, stepped care was seen to be most effective in mild to moderate and severe depression patients (Watzke et al., 2020). Due to the heterogeneity of stepped care models, it is, however, difficult to assess the effectiveness (Firth et al., 2015).

In treatment of mental disorders, collaborative care is further recommended for patients with chronic somatic diseases (National Collaborating Centre for Mental Health, 2011) and

can be combined with CL services (Archer et al., 2012). Interdisciplinary collaboration often comprises a physician, a case manager, and a mental health specialist (Archer et al., 2012). This collaborative approach can increase patient's adherence to their medication and to improve their quality of life (Archer et al., 2012). Evidence suggests that collaborative care is effective for people with mental–somatic multimorbidities (Camacho et al., 2018, Coventry et al., 2014). Collaborative care also improves somatic health (van Eck van der Sluijs et al., 2018). Healthcare professionals described collaborative care to be more suitable for severe cases (Møller et al., 2018). Some healthcare professionals lack to see benefits, which is detrimental to the implementation of collaborative care (Knowles et al., 2013). Also, some health care professionals and patients wish to spatially separate somatic and mental health care, although they emphasized the importance of holistic care (Knowles et al., 2015).

Stepped and collaborative care can be combined. Overall, this combination improved the recovery of patients (Firth et al., 2015, Härter et al., 2018). But not all studies confirmed this: some evidence does suggest missing effects on symptoms (Löwe et al., 2017). This could be due to the heterogeneity of SCCMs (Firth et al., 2015, van Straten et al., 2015). Still, the number of patients in mental health care increased (Firth et al., 2015, Löwe et al., 2017), reducing the mental health gap. Stepped and collaborative care was cost-effective (Goorden et al., 2014). Patients and the healthcare system could, thus, benefit from the implementation of SCCMs.

Implementation of stepped and collaborative care

The integration of mental health services into primary care is affected by individual, organizational, and financial factors, such as acceptability, appropriateness, credibility, knowledge and skills, motivation to change, leadership, and financial resources (Møller et al., 2018, Overbeck et al., 2016, Solberg et al., 2013, Supper et al., 2015, Wakida et al., 2018). When implementing collaborative care into primary care, time pressure and competing priorities were additional barriers while feedback and co-location of somatic and mental

health care specialists were facilitators (Overbeck et al., 2016). However, working in silos was seen to be present and challenging the implementation (Wood et al., 2017). Another important facilitator was integrated information technology (IT) systems (Wood et al., 2017) and electronic recording systems to improve communication and collaboration (Goodrich et al., 2013). This is an essential part of the level of integration (Heath et al., 2013). Commitment and sustainability could be increased by offering adaptability to the specific settings and highlighting positive outcomes of the implementation (Blasinsky et al., 2006). Missing definitions of roles and competencies impeded the implementation of collaborative care into primary care (Supper et al., 2015).

Stepped care faced similar challenges when being implemented into primary care settings (Franx et al., 2012). Different views of mental disorders, such as depression, and its care were an important barrier (Franx et al., 2012). This could be counteracted with screening. However, screenings often were not used for symptom monitoring or identification (Hermens et al., 2014). Also general practitioners were seen to rely more on their perception than on objective psychosocial symptoms (Gidding et al., 2014).

Although these studies emphasize important facilitators and barriers of implementing mental health into health care, evidence on the implementation in hospital settings is missing. Several question can be raised related to the hospital setting:

- Who should be involved in SCCMs?
- Is continuity of care guaranteed?
- Are there any other barriers to the implementation of a SCCM specific to hospital settings?

SOMPSYNET – PREVENTION OF PSYCHOSOCIAL DISTRESS CONSEQUENCES IN SOMATIC MEDICINE: A MODEL FOR COLLABORATIVE CARE

This thesis is embedded in the evaluation of "SomPsyNet", a project for SOMatic hospital patients whose goal is to promote the prevention of PSYchosocial distress and establish

a stepped and collaborative care NETwork in Basel-Stadt, Switzerland. A short description of SomPsyNet, its aims and methodology is provided to allow better understanding for this thesis.

Policy and initiatives

National and international efforts emphasize the importance of improving mental health. Worldwide, the Sustainable Development Goals (SDG), particularly SDG 3.4, aim to foster mental health and well-being (United Nations, 2015). In Switzerland, Health2020 intends to maintain quality of life and improve transparency, equality of opportunity, and quality of health care provision (Bundesamt für Gesundheit, 2013), which also continues within the Health2030 focusing on the technological and digital transformation, the demographic and social changes, the maintenance of high-quality and affordable care, and opportunities for a healthy life as depicted in Figure 1.2 (Bundesamt für Gesundheit, 2019).

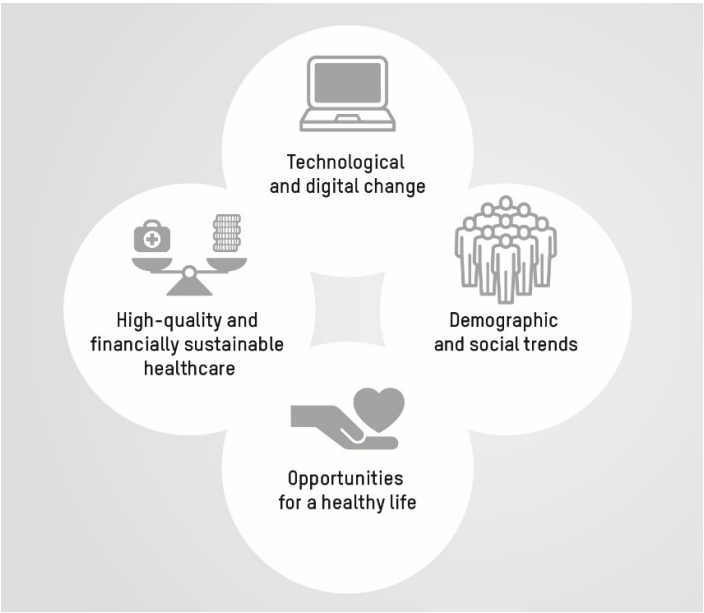

Figure 1.2 Focal areas of health politics in Switzerland within Health2030 (Bundesamt für Gesundheit, 2019)

Health2020 led to the National Strategy on the Prevention of non-communicable diseases (NCDs), which, on the one hand, supports primary prevention by implementing favorable setting to promote a healthy lifestyle and reduce risk factors (e.g. alcohol, smoking, unhealthy nutrition, and physical inactivity) in healthy people (Bundesamt für Gesundheit and Schweizerische Konferenz der kantonalen Gesundheitsdirektorinnen und -direktoren, 2016). On the other hand, secondary and tertiary prevention should be strengthened enabling improvement of quality of life and maintaining the social connectedness of already diseased populations (Bundesamt für Gesundheit and Schweizerische Konferenz der kantonalen Gesundheitsdirektorinnen und -direktoren, 2016). Therefore, the collaboration of research, health services, and health politics is essential to early detect diseases (Bundesamt für Gesundheit and Schweizerische Konferenz der kantonalen Gesundheitsdirektorinnen und -direktoren, 2016). The Swiss Learning Health System (SLHS) is one initiative to strengthen this collaboration and to bring stakeholders from different sectors together (Boes et al., 2018) to support the healthcare system in managing the challenges displayed by Health2020 and Health2030 This initiative was initially funded by ten academic partners (Mantwill et al., 2020). The SLHS offers scholarships to PhD students who gain knowledge on how to bridge research and policy through preparing a policy brief and a stakeholder dialogue (Boes et al., 2018).

With respect to the National Strategy on the Prevention of NCDs, Health Promotion Switzerland (under a mandate from the Federal Office of Public Health) promoted related projects ('Prävention in der Gesundheitsversorgung'; PGV). These projects should focus on high risk population groups or groups already suffering from NCDs, fostering the autonomy and patient's quality of life and reducing health care costs (Bundesamt für Gesundheit and Gesundheitsförderung Schweiz, 2017, aktualisiert 2019) – important aspects of Health2030 (Bundesamt für Gesundheit, 2019). In accordance with the goal of Health2030 to improve health across the life course (Bundesamt für Gesundheit, 2019), some PGV projects are targeting mental health of populations of different age and in different health care settings, i.e. PsyYoung for adolescents or SomPsyNet for somatic hospital patients (Gesundheitsförderung Schweiz, 2022).

SomPsyNet project and study

SomPsyNet is divided into a project and a study. The project is currently implementing a SCCM in four hospitals in Basel-Stadt (University Hospital Basel, University Department of Geriatric Medicine FELIX PLATTER, Bethesda Hospital, and St. Clara-Hospital) and already established an online platform to build a network for the SCCM. The study investigates the effectiveness of the SCCM based on data of three hospitals (excluding St. Clara-Hospital). The primary objective of the SomPsyNet study is to assess the health-related quality of life in somatic hospital patients with psychosocial distress. Additionally, effects on other measures of mental health, an economic evaluation, and a process evaluation take place. An external evaluation team of the Swiss Tropical and Public Health Institute and the Institute of Pharmaceutical Medicine at the University of Basel, Switzerland, supports the SomPsyNet team.

Stepped and collaborative care model

As depicted in Figure 1.3, patients go through a SCCM. Starting with an initial screening after admission to the hospital, nurses, physicians, and patients answer one question on how distressed the patient is. This is adapted from the distress thermometer used in oncology (Ownby, 2019). Afterwards, patients answer a tablet-based questionnaire including five valid and reliable tools to assess psychosocial distress: the 12-item Somatic Symptom Disorder (SSD-12) questionnaire, the 8-item Somatic Symptom Severity (SSS-8), the 8-item Patient Health Questionnaire (PHQ-8), the 7-item General Anxiety Disorder (GAD-7) questionnaire, and the 36-item Short Form version 1 (SF-36v1) questionnaire. In case of a noticeable finding, patients receive an in-depth assessment by the psychosomatic and psychiatric consultation and liaison (CL) service. The patient needs are assessed and adequate treatment (stepped care) is offered. Adequate treatment is coordinated using an online platform developed by SomPsyNet, which includes different treatment offers like mental health specialists and support for other health or social problems.

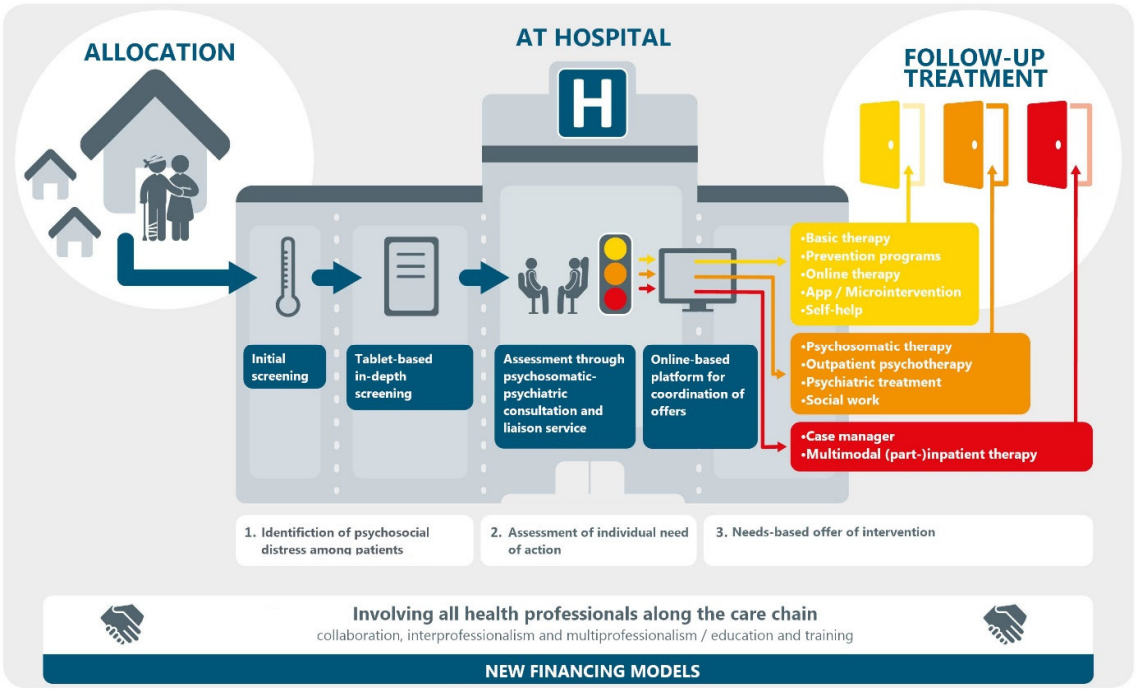

Figure 1.3 Stepped and Collaborative Care Model to prevent psychosocial distress, implemented by SomPsyNet (based on Schaefert et al. (2021))

CHAPTER 2

PhD research objectives

PhD RESEARCH OBJECTIVES

This PhD thesis is embedded in the external evaluation of the SCCM, funded by Health Promotion Switzerland. Such an evaluation aims to assess reasons why a project, here SomPsyNet, works or does not work (Fässler and Studer, 2018). The main aim of this thesis was to conduct a process evaluation of the SCCM. Due to the COVID-19 pandemic, there was, however, the interest to explore associations with the COVID-19 restrictions with patients' mental health and how other research methods could be used to monitor mental health. Based on this and the previously described gaps of knowledge, we defined the following research objectives:

Background of study objective 1: When implementing new service models such as a SCCM, the context of implementation is key. Therefore, healthcare professionals' attitudes and experiences of mental health in the hospital setting of Basel-Stadt before the implementation of the SCCM had to be explored (CHAPTER 4, BMC Psychiatry. 2021 Jul 12;21(1):349)

Objective 1: To investigate the hospital personnel's perceived importance of and experiences with patients having mental–somatic multimorbidities in hospital settings in Basel-Stadt.

Background of study objective 2: Successful implementation of a new service model highly depends on different determinants of change. It is unclear, which determinants of change to implement a routine psychosocial distress assessment in hospital settings in Basel-Stadt are present (CHAPTER 5, PLoS One 2023 Jun 30;18(6):e0285395)

Objective 2: To assess determinants that affect the implementation of a psychosocial distress assessment at the interface of mental and somatic health in hospitals in Basel-Stadt.

Background of study objective 3: The COVID-19 pandemic and its countermeasures were associated with poor mental health in the general population. However, evidence on the vulnerable population of non-COVID-19 hospital patients is missing (CHAPTER 6, Front Psychiatry. 2022 May 3;13:872116)

Objective 3: To assess the association between COVID-19 restrictions and mental health in hospital patients who were not admitted due to COVID-19 in Basel-Stadt.

Background of study objective 4: The mental health consequences of COVID-19 were profound. Social media could be used to monitor these consequences. However, several concerns have to be kept in mind. (CHAPTER 7, Int J Public Health. 2021; 66: 633451)

Objective 4: To highlight the advantages and disadvantages of using Big Data to monitor mental health during the COVID-19 pandemic.

CHAPTER 3

SomPsyNet and its evaluation

SOMPSYNET AND ITS EVALUATION

SomPsyNet study design: Stepped-wedge randomized controlled trial

The SomPsyNet study was implemented using a stepped-wedge cluster randomized trial design to allow the concurrent implementation and evaluation of the SCCM. This means that clusters (half wards) started to introduce the SCCM at a randomly assigned point in time. The introduction of the SCCM was split into different phases:

- Phase 0: treatment as usual, where patients are assessed by the consultation and liaison service upon request of the attending physician.
- Phase 1: screening of psychosocial distress is implemented, but does not have any consequences.
- Phase 2: entire SCCM; assessment by CL service after noticeable findings of the psychosocial distress screening is implemented.

Before starting Phase 1, nurses and physicians had to be trained to assess their patient's psychosocial distress. One in-person training per ward was organized, where SomPsyNet and the psychosocial distress assessment were presented. Additionally, an online training was developed, which can be accessed by all hospital employees..

SomPsyNet study hospitals

The University Hospital Basel is the largest hospital participating in SomPsyNet with 5204 full time equivalents (FTE) (Universitätsspital Basel, 2021). In 2020, University Hospital Basel employed 824 trainees and 685 junior physicians (Universitätsspital Basel, 2021). Not only education plays an important role, but also research, which is highlighted through the close collaboration with the University of Basel (Universitätsspital Basel, 2021). 37,108 patients stayed on average 5.8 days at the University Hospital Basel (Universitätsspital Basel, 2021). Most patients have compulsory insurance and 20.5% of the patients had complementary insurance (Universitätsspital Basel, 2021). The average severity of cases (Case Mix Index) lies at 1.344 (Universitätsspital Basel, 2021). The University Hospital and

the University Department of Geriatric Medicine FELIX PLATTER are public hospitals that are partially funded by the canton of Basel-Stadt (Universitäre Altersklinik FELIX PLATTER, 2021, Universitätsspital Basel, 2021).

Although the University Department of Geriatric Medicine FELIX PLATTER has a similar structure as the University Hospital Basel, collaborating closely with the University of Basel, only 717 FTE and 103 trainees are employed (Universitäre Altersklinik FELIX PLATTER, 2021). In 2020, 5143 patients were discharged from the three main specialties: acute geriatrics, geriatric psychiatry, and geriatric rehabilitation (Universitäre Altersklinik FELIX PLATTER, 2021). Average hospital stays last 20.1 days at the University Department of Geriatric Medicine FELIX PLATTER, which is related to the higher Case Mix Index of 1.521 (Universitäre Altersklinik FELIX PLATTER, 2021). One out of four patients had complementary insurance (Universitäre Altersklinik FELIX PLATTER, 2021).

In contrast to the two other hospital, the Bethesda Hospital is a private one, supported by the "Foundation Diakonat Bethesda" (Basler Privatspitäler, 2021). The core competencies of the Bethesda Hospital are medicine of locomotor system and gynecology where 536 FTE are employed (Bethesda Spital AG, 2021). The hospital stays of the 6108 patients was, with 6.2 days, similar to the one of patients at the University Hospital Basel (Bethesda Spital AG, 2021). Around a third of all patients days/nights was attributed to patients with complementary insurance (Basler Privatspitäler, 2021). Compared to the two other hospitals, the Case Mix Index of the Bethesda Hospital is lower with 0.720 (Basler Privatspitäler, 2021).

SomPsyNet evaluation methods

To achieve the objectives of this PhD thesis, quantitative and qualitative methods were used (Table 3.1). While this sub-chapter offers an overview of the methodological approaches, detailed descriptions can be found in the respective chapters.

Table 3.1 Overview of objective, methodological approaches, and time of data collection.

Objective	Methodological approach	Time of data collection
To investigate the hospital personnel's perceived importance of and experiences with patients having mental–somatic multimorbidities in hospital settings in Basel-Stadt. (CHAPTER 4)	Semi-structured interviews with physicians and nurses working on wards participating at SomPsyNet study	February to July 2020
To assess determinants that affect the implementation of a psychosocial distress assessment at the interface of mental and somatic health in hospitals in Basel-Stadt. (CHAPTER 5)	Semi-structured interviews with physicians and nurses working on wards participating at SomPsyNet study	May to September 2021
To assess the association between COVID-19 restrictions and mental health in hospital patients who were not admitted due to COVID-19 in Basel-Stadt. (CHAPTER 6)	Quantitative survey with hospital patients on wards participating at SomPsyNet study	June 2020 to April 2021
To highlight the advantages and disadvantages of using Big Data to monitor mental health during the COVID-19 pandemic. (CHAPTER 7)	Researchers' opinion	Not applicable

A process evaluation is key to understand the processes supporting or impeding the SCCM. To assess the 'how' and 'why', qualitative research methods are suitable. Thus, we decided to conduct semi-structured interviews before and after the implementation of the SCCM through SomPsyNet. The first interview study of this thesis was conducted before nurses and physicians were trained. The second interview study took place around one year after Phase 1 was implemented in all participating wards. We decided to use the framework method by Gale et al. (2013) to structure data collection and analysis. The author (NJA) conducted and transcribed all interviews, which already enhanced the second step of the framework method, the familiarization. NJA read repeatedly through all interviews and made notes to get a feeling for important topics. The third step, coding,

was done differently in the two qualitative studies. When assessing the integration of mental health in the general hospitals (CHAPTER 4), an inductive analysis was done. Hence, the codes were based on directly on the data, without prior framework or theory in mind. In the second manuscript using qualitative approaches, a deductive analyses was used (CHAPTER 5). A pre-specified framework was used to code the interviews. In a next step, the frameworks based on the inductive and deductive analyses were applied to all interviews. Afterwards, the data was charted into a matrix displaying which participant stated what within a specific code. Last, we wrote a summary and interpreted the data.

The stepped-wedge randomized controlled trial of SomPsyNet started in June 2020 with baseline data collection where psychosocial distress of patients was systematically assessed. These patient data were used to get insights into the association between COVID-19 restrictions and mental health in non-COVID-19 patients (CHAPTER 6). We focused on self-reported COVID-19-related distress and mental health consequences based on validated and reliable assessment tools.

CHAPTER 4

A qualitative study to investigate Swiss hospital personnel's perceived importance of and experiences with patient's mental–somatic multimorbidities

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A QUALITATIVE STUDY TO INVESTIGATE SWISS HOSPITAL PERSONNEL'S PERCEIVED IMPORTANCE OF AND EXPERIENCES WITH PATIENT'S MENTAL–SOMATIC MULTIMORBIDITIES

Abstract

Introduction

Mental–somatic multimorbidity in general hospital settings is associated with long hospital stays, frequent rehospitalization, and a deterioration of disease course, thus, highlighting the need for treating hospital patients more holistically. However, there are several challenges to overcome to address mental health conditions in these settings. This study investigated hospital personnel's perceived importance of and experiences with mental–somatic multimorbidities of patients in hospital settings in Basel, Switzerland, with special consideration of the differences between physicians and nurses.

Methods

Eighteen semi-structured interviews were conducted with nurses (n = 10) and physicians (n = 8) in different hospitals located in Basel, Switzerland. An inductive approach of the framework analysis was used to develop the themes.

Results

Four themes emerged from the data analysis: 1) the relevance of mental–somatic multimorbidity within general hospitals, 2) health professionals managing their emotions towards mental health, 3) knowledge and competencies in treating patients with mental–somatic multimorbidity, and 4) interprofessional collaboration for handling mental–somatic multimorbidity in hospital settings. The mental–somatic multimorbidities in

general hospital patients was found to be relevant among all hospital professionals, although the priority of mental health was higher for nurses than for physicians. This might have resulted from different working environments or inefficient interprofessional collaboration in general hospitals. Physicians and nurses both highlighted the difficulties of dealing with stigma, a lack of knowledge of mental disorders, the emphasis place on treating somatic disorders, and competing priorities and work availability, which all hindered the adequate handling of mental–somatic multimorbidity in general hospitals.

Conclusion

To support health professionals to integrate mental health into their work, proper environments within general hospitals are needed, such as private rooms in which to communicate with patients. In addition, changes in curriculums and continuing training are needed to improve the understanding of mental–somatic multimorbidities and reduce negative stereotypes. Similarly, interprofessional collaboration between health professionals needs to be strengthened to adequately identify and treat mentally multimorbid patients. A stronger focus should be placed on physicians to improve their competencies in considering patient mental health in their daily somatic treatment care.

Keywords

Mental health, mental–somatic multimorbidity, health care professional, interprofessional collaboration, hospital, qualitative interview

Introduction

Mental disorders made up 5% of the global burden of disease in 2019 (GBD 2019 Disease and Injuries Collaborators, 2020), with recent evidence suggesting an even higher burden due to the underestimation of current approaches (Vigo et al., 2016). The World Health Organization's Sustainable Development Goals (SDGs), particularly SDG target 3.4, underline the importance of treating mental disorders (United Nations, 2015). Most general hospitals primarily focus on treating somatic health conditions. However, depressive disorders, anxiety, and other mental disorders are prevalent (Rayner et al., 2014, Rose et al., 2011, Tuch, 2018). Often, mental disorders are observed as multimorbidity with somatic conditions. For instance, depression is frequently found in combination with coronary heart disease, with the two conditions likely re-enforcing each other (Prince et al., 2007).

The literature on the prevalence of mental disorders in general hospital settings is limited and not current (Walker et al., 2018). The prevalence of depression and anxiety in patients in European general hospitals range from 6 to 61% and 11–25%, respectively (Moayedoddin et al., 2013, Ni Mhaolain et al., 2008, Rayner et al., 2014, Rentsch et al., 2007, Topitz et al., 2015, Uhlenbusch et al., 2019, Walker et al., 2014). A recent analysis of mental comorbidities in Swiss acute hospitals indicated that 11% of acute hospital patients had received a psychiatric diagnosis (Tuch, 2018). These patients typically experienced a longer hospital admission and were more frequently rehospitalized, with the associated increased health care costs (Rose et al., 2011, Tuch, 2018). Mental multimorbidity was associated with negative progression of the somatic conditions (Rose et al., 2011), and typically remained undetected or, if diagnosed, neglected (Rose et al., 2011, Schlapbach and Ruflin, 2017, Rettke et al., 2020), which is linked to increased mortality (Prince et al., 2007, Tuch, 2018). Hence, the early detection and treatment of mental health disorders are crucial (Patel et al., 2018, Wittchen et al., 2011).

To identify and treat mental–somatic multimorbidity in general hospital settings, a holistic approach is desired (Prince et al., 2007). However, reviews of this issue have found that

patients with simultaneous somatic and mental health conditions receive inadequate care due to health care professionals having low mental health literacy (Giandinoto and Edward, 2014, Henderson et al., 2014) and low confidence in intervening in difficult clinical situations (Giandinoto and Edward, 2014). The rather low emphasis on mental health in health professional curriculums is a major factor for this negative outcome. Physicians undergo training with a strong focus on biomedical and technical aspects related to somatic health conditions, especially compared to nurses, who are expected to have interpersonal skills and are trained accordingly (Hughes and Fitzpatrick, 2010).

Health care tasks are allocated across the various health professionals based on their educational background, and this shapes the interprofessional collaboration between physicians and nurses. Interprofessional collaboration has been found to positively influence patient outcomes, such as blood pressure and patient satisfaction (Matthys et al., 2017). Likewise, interprofessional collaboration among hospital departments is known to be beneficial (Reeves et al., 2017), and efforts to promote collaboration are encouraged in hospitals. One example is psychosomatic/psychiatric consultation and liaison (CL) services, which mediate between somatic wards and mental health specialists, providing physicians in general hospitals with advice on the patient's psychosocial issues and how to handle them (Lipowski, 1971). However, insufficient referrals to the CL service have been observed (Huyse et al., 2001, Innes et al., 2014), highlighting potential barriers to integrating mental health care into general hospital settings.

It is, therefore, necessary to better understand the hospital personnel's view of mental–somatic multimorbidity in general hospitals. Hence, this study investigated hospital personnel's perceived importance of and experiences with patients having mental–somatic multimorbidities in general hospital settings in Basel, Switzerland. In addition, we explored differences between physicians and nurses regarding the management of mental–somatic multimorbidities in general hospitals.

Materials and methods

Study setting

This qualitative study was conducted in Basel, Switzerland, in three general hospitals (University Hospital Basel, Bethesda Hospital and the University Department of Geriatric Medicine FELIX PLATTER). These institutions are part of a project called SomPsyNet (Clinicaltrials.gov), which aims to prevent the consequences of psychosocial distress of patients in somatic acute hospitals by establishing a collaborative care network. To this end, these hospitals are implementing a stepped and collaborative care model in the daily hospital routines of selected wards to more appropriately and effectively identify and address the psychosocial burden of patients admitted for somatic conditions.

The University Hospital Basel and the University Department of Geriatric Medicine FELIX PLATTER are involved in teaching and research. The latter focuses on acute geriatric medicine, geriatric psychiatry, and rehabilitation. The Bethesda Hospital is a private hospital focusing on gynecology and rehabilitation. Regarding patient volumes, 5365 patients were discharged from the University Department of Geriatric Medicine FELIX PLATTER (Universitäre Altersklinik FELIX PLATTER, 2021), 38,570 from the University Hospital Basel (Universitätsspital Basel, 2021), and 6062 from Bethesda Hospital (Bethesda Spital AG, 2021) in 2019.

This study was approved by the Ethics Committee of Northwest and Central Switzerland (EKNZ; ID Req-2019-01219). All the interviews were conducted upon written informed consent.

Study population

Three categories of health professionals were interviewed: nurses, physicians, and hospital administration personnel such as project and data managers, and IT specialists. Three interviewees, one psychologist and two psychosomatics, belonged to the CL service team to obtain their input on the collaboration with other hospital departments. Due to our

interest in the nurses' and physicians' perspectives, data from health administration personnel were excluded from this analysis. To guarantee privacy, we included the data of the psychologist with the nurse group. The health professionals represented different hospital services: gynecology, rehabilitation, rheumatology, internal medicine, and psychosomatics. All interviewees were involved in SomPsyNet, either in the planning or later in the implementation. The first author (NJA) contacted the SomPsyNet project team and the hospital ward line managers to request the contact information of potential interviewees differing in age, gender, and job position. In this way, various perspectives within the professional groups were included. The potential interviewees were then contacted by email. The interviewees and NJA did not know each other before the interviews.

Data collection

The interviews were conducted using a semi-structured interview guide (Appendix 1) developed based on the literature and discussions within the research team. After pilot-testing with three former nurses, the interview guide was adapted to focus on four main topics: 1) knowledge about mental health in somatic patients, 2) experiences with the mental health of somatic patients, 3) clinical processes at the hospitals regarding patients with mental–somatic multimorbidity, and 4) personal attitudes towards the mental health conditions of patients treated for somatic health conditions. The semi-structured interviews were conducted between February and July 2020 prior to the launch of the new mental health-focused project, SomPsyNet. Due to the SARS-CoV-2 pandemic, six interviews with physicians were conducted over the phone. All other interviews were conducted in person at the interviewee's workplace, in a location where they felt comfortable. To be able to speak openly, the interviews were conducted in Swiss German or German, depending on the interviewee's preference. All interviews were audio-recorded and conducted until the information provided was redundant. Developing the

interview guide, conducting the interviews, and analyzing the data were carried out by NJA, a female epidemiologist who has attended several qualitative research courses.

Data analysis

The interviews were transcribed verbatim and coded in NVivo 12 (QSR International Pty Ltd., 2018). Based on an in-depth reading of the transcripts, codes and themes for inductive analysis were developed. Framework analysis (Gale et al., 2013) was used to extract the perceived importance of and experiences with mental health in somatic patients, because this analysis method enabled a comparison of the professional groups. The seven steps recommended by Gale et al. were followed: 1) transcription, 2) familiarization with the interview, 3) coding, 4) developing a framework, 5) applying the framework, 6) charting data into a framework matrix, and 7) interpreting the data (Gale et al., 2013). To guarantee reflexivity, NJA kept detailed research notes and had discussions with her supervisor (KW). The research notes included reflections after each interview, which were consulted during the analysis. Due to the high workload of health professionals and resulting limited availability, we did not conduct member checking. Reporting was guided by the Consolidated Criteria for Reporting Qualitative Research (COREQ-32) (Tong et al., 2007).

Results

Table 4.1 Demographic characteristics, affiliated institutions and duration of interviews (*n* = 23)

Characteristics	Physician (*n* = 8)	Nurse (*n* = 10)*
Age [years]		
Mean (SD)	38.8 (10.2)	43.4 (13.5)
Range	28 - 59	26 - 62
Sex [N]		
Female	5	8
Male	3	2
Years in profession		
Mean (SD)	10.1 (10.1)	18.5 (13.4)
Range	3 - 32	4 - 35
Hospital [N]		
University Hospital Basel	4	7
Bethesda Hospital	4	3
Department [N]		
Rheumatology	1	1
Rehabilitation	1	1
Internal Medicine	3	6
Gynecology	1	1
Psychosomatics	2	1
Duration of interview [min]		
Mean (SD)	26.6 (7.5)	34.2 (9.6)
Range	14.6 - 35.4	19.0 - 46.3

The table represents the number of interviewees in categorical variables (sex, hospital, department) and the mean, standard deviation (SD) and range of continuous variables (age, years in profession, duration of interview).

*including one psychologist belonging to the CL service

In total, 18 semi-structured interviews were conducted, with an average duration of 30 min each (15–46 min). The professional groups displayed similar demographic characteristics, except that most of the interviewees were women and the nurses had more professional experience than the physicians (Table 4.1).

Among the 18 interviews, four themes regarding general hospital settings were extracted inductively: 1) relevance of mental–somatic multimorbidity within general hospitals, 2) health professionals managing their emotions towards mental health, 3) knowledge and competencies in treating mental–somatic multimorbidities, and 4) interprofessional collaboration for managing mental–somatic multimorbidities within general hospitals.

Relevance of mental–somatic multimorbidities within general hospitals

Mental–somatic multimorbidity was defined in the interviews as somatic patients with any kind of mental health issue. The prevalence of mental–somatic multimorbidity among somatic patients admitted for hospital care was perceived to be high. Medical events, such as requiring a visit to an emergency department or receiving a cancer diagnosis, were described as having a large impact on patients' mental health. Only one physician stated that encountering mental–somatic multimorbidity in their daily routine was infrequent, however, they admitted that these conditions might remain unrecognized.

> *"Well, speaking in relative terms, we have lots of patients, but I think that relatively few patients actually have a mental disorder or stress. Obviously, maybe we don't recognize them."* physician, age 32, male

However, all interviewees agreed on the importance of mental health in general, although its priority may depend on the professional group and the specialty they work in. While mental health was a high priority for nurses, it was lower for physicians.

> *"I do believe that for nurses it (mental health) is of greater importance, since it is them who have a lot of contact with the patients and must deal with the various emotions"* physician, age 42, female

The separation of body and mind was perceived by many as artificial because they had observed the impact that mental health conditions could have on somatic symptoms, signs, and treatment.

> "*Let's take for example oncology patients that are often confronted with pain. If one focuses on the somatic side of things, the patient will receive very high dosages of pain medication. This also occurs with conventional medicine physicians. With more experience one might be able to notice, or others around you make you aware of it, that there is a strong psychosomatic side to it and when one tries to remove a patient's fears and worries, this actually contributes to decreasing the overall painkiller prescriptions, although not much has changed at the somatic level."* physician, age 43, male

Concurrently, these quotes emphasize the effect that mental health conditions could have on a patient's hospital stay. As stated by our interviewees, patients suffering from mental–somatic multimorbidity were less likely to adhere to their somatic conditions treatment, leading to lower treatment success. The nursing staff further described patients as *"difficult"* because *"the patient does not do what we (the nursing staff) want them to do"* (nurse, age 43, female). Thus, they emphasized that more effort and time, a scarce resource in this setting, were needed to treat patients with mental–somatic multimorbidity. This situation also applies to the time before the mental health condition is diagnosed. Physicians have experienced the challenge of finding an explanation for some patient's somatic complaints.

> *"Exactly, but I do believe that this notion is often in the back of the mind of the assistant physician. Only when they have done everything they can possibly do and have considered various options and there is nothing that can possibly match, then one is glad to be able to see further if it might be psychological or due to pressure or something similar."* physician, age 42, female

The recognition of mental–somatic multimorbidity could depend on the length of hospitalization. According to our interviewees, the duration of hospitalization affects the

recognition of mental–somatic multimorbidity in different ways. First, the longer the patient stays, the more likely that symptoms of mental health conditions will evolve. Therefore, patients hospitalized for orthopedic procedures with a comparatively short hospital stay are less likely to display mental health symptoms than patients admitted for a longer term in internal medicine. Second, physicians and nurses have a greater chance to recognize mental symptoms in cases of longer treatments and hospital stays. Even if patients try to hide their feelings, with a longer duration of care, they might build up trust and report certain concerns. However, most interviewees reported not being able to efficiently use the duration of hospital stay.

> *"It can also be extremely exhausting since our daily work in our unit barely allows us to have the necessary time to adequately treat and help patients."* nurse, age 37, female

In particular, physicians' high workload hindered the adequate recognition and treatment of patients with mental–somatic multimorbidity in general hospitals. Time constraints led to lowering the priority of mental health conditions in these settings.

> *"With such a tight work schedule, it's easier to prescribe a blood sample analysis or, as an example in the case of an oncology patient, to increase their painkillers, rather than conducting a longer conversation, where anxieties may be discussed."* physician, age 43, male

In addition to the limited time, insufficient privacy and tranquility was highlighted by the nurses.

> *"[…] we are in the room, talking (with the patient). There is always somebody entering the room 'Could you … ' or we have hospital rounds or must answer the phone. Especially with such diseases, I think that tranquility and being able to sit at the bedside and just talk (to the patient) without being constantly interrupted are the most important."* nurse, age 29, female

Another reason for the late recognition of mental health conditions by health

professionals could be social norms. Most interviewees described mental health as a taboo in society, although this deviated from their personal view. Depending on age, gender, and culture, patients have not been talking about their mental health because this is often seen as a weakness or failure. The societal view could affect the physicians and nursing staff by increasing their anxiety and inhibit them from actively bringing up mental health issues.

> *"Suicide risk is a topic that is inherently connected to a lot of fear, and that when one dares to talk to other people (patients) about it … there is a deep inner fear."* nurse, age 55, female

> *"Most of the time, the questions are related to fears. We always are afraid to talk about such things, about 'Oh, now, I cannot talk to a patient about psychosomatics or psychiatric issues or sexual issues or death or similar taboos.' I sometimes realize that these are our own fears. If we bring these up with patients, their willingness to talk about it is high."* physician, age 43, male

Managing emotions towards mental health conditions in general hospital settings

Various emotions of the health professionals related to the patients' mental health and working with these patients were described, such as difficulties in understanding the patient, difficulties in maintaining a professional attitude, powerlessness, uncertainty, anger and the feeling of being left without support. These emotions arose in situations with patients but also in interactions with other health professionals.

The medical staff of the included hospitals has several possibilities to talk about their concerns and experiences with handling mental health problems among patients. First, the line manager can offer support to the nursing staff. If a nurse is suffering mental health issues such as anxiety, the line manager will try to alleviate their duties and find them appropriate support. Similarly, if difficulties with patients occur, the line manager is supportive.

> *"In everyday life, one realizes that it can be momentarily quite difficult and when patients simply do not do what we would like them to. This can cause one to be angry and storm out—there are such moments. We have line managers in our department that are responsible; when this occurs, they say 'Yes, that is just another additional problem that we have to look at'."* nurse, age 43, female

Second, talking to mental health specialists helped the interviewed health professionals to deal with the emotions, especially when working with *"difficult patients"*. Sometimes, the mental health specialist joined the team meetings to explain the patient's manipulative or aggressive behavior, leading to a better understanding by the nursing staff.

> *"When the patient receives a diagnosis or it is otherwise understood that he has always been this way, I don't have the pressure that this behavior has to stop now. It is then mostly trying to tolerate the situation somehow."* nurse, age 59, male

Third, the exchange with team members or private contacts who also work in health care is important for health professionals to manage their own emotions. These exchanges can offer some reflections on patient situations.

> *"I am also somebody who needs extra reassurance. Was it ok or not how I handled it? I will also ask for advice because I have an unsure feeling and I am aware that it can always have been dealt with better or simply differently. I would like support such as 'Yes, it was fine the way you did it' or 'This and that could be done differently next time'."* nurse, age 26, female

This support can occur through interacting with colleagues who have the knowledge and competencies needed to treat patients with mental health conditions.

Knowledge and competencies in treating mental–somatic multimorbidity in patients admitted for a somatic conditions

Knowledge about mental symptoms, and competencies in handling multimorbid patients were mentioned to be influenced by several factors that affect the detection of mental health conditions in general hospitals. Physicians and nursing staff both have had a strong focus on somatic issues because this is typically the primary reason for hospitalization. Therefore, physicians only considered mental components *"if lots of somatic issues are excluded"* (physician, age 42, female). This blind spot was already forming during their education and training.

> *"[…] due to our background, we aren't competent to always include both (somatic and mental health conditions)"* physician, age 43, male

As emphasized by these quotes, the training of nurses and physicians concentrates more on somatic conditions than on mental health. Reasons for this insufficient education and training were explained through *"little evidence-based methodology"* (physician, age 33, male) on mental health conditions in general hospital settings and through a lack of sensitivity towards mental health. Although one physician observed a change in sensitivity, it was highlighted that time is needed to integrate mental health into the curriculum. During training, the nursing staff has to decide early on what their educational focus will be (psychiatry, acute somatic, or long-term care), limiting the access to knowledge and competencies related to mental health in somatic care. As nursing staff mentioned, despite partially learning how to handle these patients, it differed from reality.

> *"It has been discussed practically and theoretically how you should proceed in such a case. Nonetheless, I do believe that when confronted with reality it is very different."* nurse, age 26, female

Mock situations during education and training were not able to mirror the behavior of patients, which influenced the identification and acceptance of mental–somatic multimorbidity. Interviewees mentioned perceiving various patient behaviors: While some patients were perceived as manipulating nursing staff and playing nurses off against each

other, other patients were perceived as masking their feelings. Therefore, sensitivity for trivial statements and symptoms is essential, although it can be overwhelming in the beginning.

> *"I have always tried, which is something I also tell the nurses, to be extra attentive like an extra-terrestrial with many antennae picking up signals. Even if one is doing something small, such as measuring blood pressure, changing the infusion bottle or something quite routine, you should always enter the room with these antennae trying to sense what else is going on."* nurse, age 56, female

Despite limited time with the patients, most interviewees emphasized the importance of communication and informing patients about their health status and the further actions to be taken. Reassuring conversations could help patients to calm down in escalating situations. Moreover, it is important to listen to the patients and *"believe that this, what this person says, in fact, has now any justification or truth"* (physician, age 43, female). Physicians stated the importance of taking patients seriously and communicating clearly.

> *"One often reduces, a bit, existing prejudices; in particular, psychiatric problems. People say 'Yes, well I am not crazy or anything'. There is a false concept of what psychiatric or psychosomatic questions are, and what lies behind them. One tries to bring more awareness and clarity to this false concept."* physician, age 43, male

Due to these misconceptions, patients were sometimes not willing to open up. Hence, one nurse suggested offering the patients to talk to them at another time or to speak with other nursing staff, demonstrating the importance of collaboration within the hospital.

Interprofessional collaboration for managing mental health conditions in general hospitals

Nurses seem to be "*more and more on eye-level"* (nurse, age 62, male) with physicians. Still, nurses described the interprofessional collaboration between nurses and physicians

as mixed. While some physicians value nurses' opinions, others still see them as "auxiliary" staff. This led to nurses repeatedly pointing out potential mental–somatic multimorbidity while feeling left on their own.

> *"[…] because most often they (nursing staff) recognize these things (mental health conditions) and then, they seek out help with no response. They feel that nobody cares. There's a problem here."* nurse, age 56, female

However, especially with complex patients, the physicians stated that they relied on information from the nurses because nurses spend more time with the patient. The interprofessional collaboration between nurses and physicians, therefore, depends on both professionals.

> *"We have doctors with whom collaboration is excellent. They recognize it (mental health conditions) well. […] But if they run into an ignorant nurse, then it progresses just as little as vice versa."* nurse, age 62, male

Nonetheless, the physicians decide upon the course of action taken and whether, for instance, the psychosomatic/psychiatric CL service—the main route of interprofessional collaboration between the different wards and the mental health professionals—should be involved. Either the physicians recognize the necessity of consulting with the mental health specialist or the nursing staff notify them of this need, because nurses recognize it due to closer patient contact. After the consultation, the physicians receive feedback, including treatment recommendations if necessary.

Most physicians rated this way of collaboration as efficient. Nevertheless, others questioned the fact that specialties have been separated and the lack of knowledge about mental–somatic multimorbidity among physicians, because the physicians might overlook important information. In addition, they might not be able to ask precise questions, diminishing the psychosomatic / psychiatric CL service's efficiency.

> *"[…] this is maybe our fault or flaw. We are poorly trained for these kinds of questions. We cannot ask good enough consultation questions that allow us to*

get the answers (by the CL service) that we want." physician, age 43, male

The nursing staff highlighted other critical aspects about the psychosomatic/psychiatric CL service—the nursing staff cannot trigger a consultation on their own, the wait until patients receive medication or other support can be too long, and sometimes too many people are involved in the process.

> *"It can take around 2-3 days until it's filled out and around a week or more until the psychologist can arrive. If they also need medication, it can take up to 2-3 weeks until they start to feel the effects. So, all in all, it is an extremely long process until things start to look up."* nurse, age 43, female

> *"There are drawbacks if too many people start to get involved, such as a decreased quality of the inter- and intra-disciplinary communication. If too many people are pulling on various threads and have a say, it becomes too much."* nurse, age 37, female

One nurse mentioned that mixing the somatic and mental health staff on the wards could lower the obstacles nurses face in convincing physician about the need for a consultation with the mental health specialist. As one interviewee mentioned, something similar has already been in place in one of the hospitals, for example, the liaison service where some psychologists are employed at a specific ward. In cases where support is needed by the psychosomatic/psychiatric CL service, this psychologist can take over.

At one hospital, rehabilitation and rheumatic wards have weekly interdisciplinary team meetings in which attending physicians, psychiatrists, physiotherapists, case managers, and the nursing staff are present to discuss each patient. However, due to time constraints, instituting interdisciplinary team meetings in all wards has not been possible.

> *"It would be ideal to have an interdisciplinary relationship between departments. Unfortunately, this is not necessarily possible in every department. First, counselling doesn't occur all that often and it takes up a lot of time passing when we cannot treat other patients. One has to take into consideration the economic*

> *means. It would naturally be ideal to have a particular time set aside to have the opportunity to talk, but this, of course, does not always work in a daily-life."* physician, age 59, female

Similarly, case conferences have been conducted in some wards and hospitals. Here, physicians and/or nurses present a specific patient who concerns them. By contrast, in interdisciplinary team meetings, all patients are discussed. The case conferences took place within the same professional group and wards, and also between different professional groups and wards, increasing the sensitivity of the hospital staff.

> *"During case conferences, often ethics problems are left out and one rather looks into the nursing process. We will assess whether anything was missed or whether the supposition that we have about the particular patient is, and on this basis sensitize the health professional 'Aha, there is more than, mobilizing, washing, nursing, hair-drying and such things.'"* nurse, age 62, male

The nursing staff and three physicians further described different types of informal collaborations, such as exchanges within the team and with people in the private setting who have the same job. A functional team was characterized as a space where problems, anxieties, and worries are shared with others, leading to exchanges about treatment strategies or support for each other, for instance, by taking over a patient.

> *"It is my belief that the manifestation of a functioning team is when one can freely express own necessities and this is positively perceived by one's colleagues, and in turn, one offers help."* nurse, age 31, female

Exchanges within the team are particularly relevant if some team members lacked understanding of the *"difficult patient*" and thus exhibited unprofessional behavior.

> *"The following is expressed in dissatisfaction, where they don't want to take care of the patient anymore since they don't get along. Negative things are said, which one hardly wants to repeat, which is truly unfortunate. There are many negative reactions that can manifest themselves."* nurse, age 37, female

However, such exchanges did not take place in all teams. In particular, physicians felt that the pressure of establishing their careers and their lack of sensitivity towards mental health limited their exchanges.

> *"Well I think that is not much of a topic; simply, as we previously described, due to an outdated image. Also in psychology, as at the Center Hospitals, one is exposed to a certain pressure, especially the young doctors, who still have to establish themselves. Particularly there, it is a little bit difficult to discuss such things. Be it from one's own personal experience or be it also that one wants to out oneself to have a particular sensitivity for such questions. So the tone is usually more offhand."* physician, age 43, male

Discussion

Mental–somatic multimorbidities were generally rated important and relevant in general hospitals, although nurses gave more weight to the mental health dimension than the physicians did. Effective and efficient handling of mental health conditions among somatic patients faces various challenges, including the strong focus of hospitals on somatic conditions, the absence of sufficient knowledge and competencies for dealing with mental health problems, and weak interprofessional collaboration.

Relevance of mental–somatic multimorbidity within general hospitals

The importance of mental health in general hospital settings is highlighted by the perceived high frequency of mental–somatic multimorbidity among patients. This is in accordance with cross-sectional studies (Moayedoddin et al., 2013, Ni Mhaolain et al., 2008, Rayner et al., 2014, Rentsch et al., 2007, Topitz et al., 2015, Uhlenbusch et al., 2019, Walker et al., 2018, Walker et al., 2014), although the literature on the prevalence of depression in general hospitals is fragmented, and previous studies are not conclusive

(Walker et al., 2018). However, it must be assumed that health professionals cannot identify the full range of multimorbidities for a variety of reasons.

In Switzerland, Rentsch et al. (2007) stated that only half of depressive patients are detected, which is in line with the low recognition of mental health conditions in hospital settings in other studies (Canuto et al., 2016, Cepoiu et al., 2008, Härter et al., 2004, Wancata et al., 2000). Obstacles to recognizing mental disorders are the patient's age, personality traits, and the severity of the mental issues (Canuto et al., 2016). Further, the recognition is dependent on the age and specialty of the physician (Chen et al., 2016). In addition to barriers such as stigma and a lack of knowledge and sensitivity, the physicians' high workload is a strong barrier to recognizing mental–somatic multimorbidity. Physicians particularly encountered strong limits to their availability impeding their contact time with patients and interprofessional collaboration with other health professionals. Hence, combined with the pressure to establish a somatic-based career, the time constraints lead to inadequate recognition of mental–somatic multimorbidity.

An additional challenge is the strong focus on treating somatic health conditions at hospitals to the detriment of treating mental health conditions in this setting. This strong focus on somatic health conditions leading to insufficient access to mental health services in general hospitals was even stated by patients diagnosed with a personality disorder (Sharda et al., 2021). Previous studies described that health professionals working in a general hospital do not see mental health conditions as belonging to their competencies and tasks (Giandinoto and Edward, 2014, Foye et al., 2020). On the one hand, this could be triggered by the high workload, reducing the time available for such tasks. On the other hand, as mentioned by some interviewees in our study, this strong focus begins during health professionals' early education, leading to a lack of knowledge and competencies.

The lack of knowledge and competencies was described as a major barrier to mental health treatment in a somatic setting (Giandinoto and Edward, 2014) and was mentioned by some physicians in our study. However, this lack may depend on the specialty: where

major life changes, such as a cancer diagnosis, are seen to have large impacts on mental well-being, a more holistic approach is desirable. Furthermore, a lack of knowledge could lead to more negative attitudes (Giandinoto et al., 2018), highlighting the importance of education and training. Nonetheless, younger nurses mentioned that theory and practical situations differ greatly, impeding optimal preparation to work with patients suffering from mental–somatic multimorbidity. These difficulties may arise due to the unpredictable behavior of the patient.

Nurses' and physicians' differing perspectives on mental health in general hospitals

Patients' unpredictable behavior is related to the lack of adherence to suggested treatments and to the difficulties in handling these patients because these patients may not follow the nurses' directions. In this regard, nurses reported dealing with *"difficult patients"*, which has been emphasized by others (Giandinoto and Edward, 2014, Giandinoto and Edward, 2015, Knaak et al., 2017), indicating that negative stereotypes remain. One possible reason why only nurses perceive a patient as *"difficult"* may be the increased time they spend at the bedside compared to physicians. According to Giandinoto et al. (Giandinoto and Edward, 2015), this perception is related to the somatic hospital setting not being appropriate for multimorbid patients suffering from mental and somatic health conditions, because the patient's adherence is diminished, and the hospital environment appears to be insufficient.

In our study, a suboptimal environment was mainly emphasized by nurses. They stated the great importance of offering a calm and private room for discussions of the patient's mental health. However, this environment is not available in all wards. For instance, busy emergency department does not have the time or space to discuss sensitive matters. Similarly, other somatic settings have difficulties owing to insufficient infrastructure (Giandinoto and Edward, 2014), such as noisy places or places that lack privacy (Innes et al., 2014). While physicians can sometimes take the patient to a private room and talk

without interruptions, nurses typically do not have this opportunity despite their considerable interest in supporting patients with a more holistic approach.

The physicians more frequently made referrals for patient support for mental health conditions without explicitly communicating the situation with their colleagues. On the one hand, this could be due to time pressure and the historical view of their superiors and other colleagues, leading to the pressure to concentrate on somatic conditions. On the other hand, the described societal view of mental health may lead to fear of addressing mental health with the patient. Other studies observed that fear regarding patients' unpredictability impeded adequate treatment (Giandinoto and Edward, 2015).

While these factors can lead some physicians to be hesitant to talk about mental health in general hospital settings, other physicians might be reluctant to integrate mental health issues at all. The physicians' strong focus on the patient's medical condition (Casanova et al., 2007) and differences in the duration of work experience (Giandinoto and Edward, 2014), might lead to see mental health not as part of their business (Foye et al., 2020) and, in turn, to physicians' hesitancy in integrating mental health in somatic hospital settings.

Interprofessional collaboration for managing mental health conditions

As observed in our study, different routes of interprofessional collaboration are possible, such as team meetings across health professionals, either formal or informal, and psychosomatic/psychiatric CL services. The latter has been shown to improve patient outcomes (Matthys et al., 2017). Nevertheless, the interviewed physicians emphasized that interprofessional collaboration could be inefficient due to a lack of knowledge. According to previous studies, the lack of knowledge and competencies (Fißler and Quante, 2015) and the not recognizing mental health conditions (Chen et al., 2016) leads to reduced referrals to psychosomatic/psychiatric CL services, supporting our results that a lack of knowledge is an important barrier to identifying mental health conditions in general hospitals. Other barriers to referrals to psychosomatic/psychiatric CL services were time pressure and poor communication among mental health professionals (Chen et al., 2016).

Open, transparent, and regular communication between nurses and physicians was seen to facilitate interprofessional collaboration (Martin et al., 2010). However, in our study, the nurses described some physicians not accepting nurses' views. Similar observations were reported by another Swiss study (Rettke et al., 2020). Differing perceptions of collaboration might be one reason—while nurses see their competency in supporting decision-making regarding the patient's treatment, some physicians still perceive them as "auxiliary" staff (House and Havens, 2017, Tan et al., 2017, Tang et al., 2013). Another reason for the differing perceptions of nurses and physicians is their educational background. Whereas the educational focus of physicians is biomedical knowledge and technical skills, nurses are also trained in interpersonal skills, including working in a team (Hughes and Fitzpatrick, 2010). These interpersonal skills might enhance the nurses' ability to adequately recognize and treat patients with mental–somatic multimorbidity in general hospitals. Overcoming communication barriers would increase trust and respect, thereby enhancing effective collaboration between nurses and physicians. Still, structural barriers such as contact times between health professionals might impede this transformation.

The frequency of interactions and time constraints build different ward cultures that, in turn, influence collaboration (House and Havens, 2017). Time pressure, unclear role and task descriptions, and poor organization were barriers to interprofessional collaboration between nurses and physicians (Martin et al., 2010) as well as between somatic and mental health specialists (Foye et al., 2020). This might amplify challenges in communication, further leading to unrecognized mental health conditions. However, Jasmin et al. (Jasmin et al., 2019) observed an improvement of interprofessional collaboration with time.

Strengths and limitations

This study has several methodological advantages. Nurses and physicians from different hospitals in the same canton were interviewed. One of the hospitals implements a mixed system. This hospital is run by a chief physician who cooperates with affiliated ambulatory attending physicians, giving a broader view into differences in experiences with mental

health and interprofessional collaboration. This provided information about the potential scale up of mental health projects in general hospital settings.

However, this study also has some limitations. The recruitment strategy involved line managers proposing the interviewees. The hospital personnel's experiences with and perceived importance of mental health in general hospital settings might therefore be limited. As the nurses mentioned, some colleagues had less understanding of mental health issues in the somatic setting. One direction of future research should be to study these health professionals to assess the reasons for their feelings and behavior, and evaluate how changes could be made.

Further, the included wards do not represent the full range of hospital wards. For instance, surgery departments with rather short hospital stay durations might place low importance on mental health because they may not be as confronted with these issues as, for example, an internal medicine ward is. Challenges occurring with patients having severe mental disorders, such as schizophrenia or bipolar disorders, were not explicitly mentioned by our interviewees. Also, there was no mention of issues related to suicide ideation or attempts, which may be partially explained by the fact that patients specifically presenting with related conditions are commonly hospitalized in acute psychiatric hospitals. Future research in Swiss general hospitals may consider focusing on these patients.

As with all interview studies, we cannot exclude the possibility that interviewees gave socially desirable answers. However, we stressed the importance of conducting the interviews in a place where the interviewees felt comfortable. This was highlighted for in-person and phone interviews. Some interviews took place in a cafeteria, and people who were not involved in the study were able to enter the room. Nevertheless, the interviewees did express critical views, indicating that they felt comfortable and spoke openly.

Considering that this study was launched right before the SARS-CoV-2 pandemic in Switzerland, we cannot exclude effects of the pandemic on the views expressed by the health professionals. On the one hand, during this time, the importance of mental health

was widely discussed, and health professionals' attitudes towards patients with mental–somatic multimorbidity could have been positively influenced. On the other hand, the health care system switched its focus from non-communicable diseases to communicable diseases. Therefore, the perceived importance of mental–somatic multimorbidity could have been diminished.

Conclusion

These findings suggest that mental health conditions among hospital patients being treated for a somatic conditions were seen to be frequent. Furthermore, the need to adequately address and deal with mental–somatic multimorbidity was perceived to be high by hospital staff. The interest in integrating mental health issues in general hospitals seemed to be higher for nurses than for physicians. However, some of the nurses' views of patients show that negative stereotypes of mental conditions still exist. Moreover, structural and communication challenges were apparent, impeding the adequate treatment of mental–somatic multimorbidity in general hospital settings.

Offering an appropriate environment for handling multimorbid patients in a calm and private setting should be promoted. Further, strengthening interprofessional collaboration and improving knowledge and competencies related to mental–somatic multimorbidity are essential to improve patient health outcomes and to address negative stereotypes, and should be prioritized during education and continuing training. Physicians should be particularly targeted by awareness and educational programs to encourage them to integrate mental health treatment in general hospitals.

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CHAPTER 5

Facilitators and barriers of routine psychosocial distress assessment within a stepped and collaborative care model in a Swiss hospital setting

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FACILITATORS AND BARRIERS OF ROUTINE PSYCHOSOCIAL DISTRESS ASSESSMENT WITHIN A STEPPED AND COLLABORATIVE CARE MODEL IN A SWISS HOSPITAL SETTING

Abstract

Introduction

Stepped and Collaborative Care Models (SCCMs) have shown potential for improving mental health care. Most SCCMs have been used in primary care settings. At the core of such models are initial psychosocial distress assessments commonly in form of patient screening. We aimed to assess the feasibility of such assessments in a general hospital setting in Switzerland.

Methods

We conducted and analyzed eighteen semi-structured interviews with nurses and physicians involved in a recent introduction of a SCCM model in a hospital setting, as part of the SomPsyNet project in Basel-Stadt. Following an implementation research approach, we used the Tailored Implementation for Chronic Diseases (TICD) framework for analysis. The TICD distinguishes seven domains: guideline factors, individual healthcare professional factors, patient factors, professional interactions, incentives and resources, capacity for organizational change, and social, political, and legal factors. Domains were split into themes and subthemes, which were used for line-by-line coding.

Results

Nurses and physicians reported factors belonging to all seven TICD domains. An appropriate integration of the psychosocial distress assessment into preexisting hospital processes and information technology systems was the most important facilitator. Subjectivity of the assessment, lack of awareness about the assessment, and time constraints, particularly among physicians, were factors undermining and limiting the implementation of the psychosocial distress assessment.

Conclusions

Awareness raising through regular training of new employees, feedback on performance and patient benefits, and working with champions and opinion leaders can likely support a successful implementation of routine psychosocial distress assessments. Additionally, aligning psychosocial distress assessments with workflows is essential to assure the sustainability of the procedure in a working context with commonly limited time.

Introduction

The global burden of mental disorders remains high (GBD 2019 Mental Disorders Collaborators, 2022). Mental disorders often remain undetected or untreated, particularly in patients with mental–somatic multimorbidities (Rose et al., 2011, Olariu et al., 2015). One possibility to overcome this gap are stepped and collaborative care models (SCCMs). The main idea of stepped care is to identify and deliver the least invasive, but most effective treatment, and then stepping up treatment if disease burden reaches a specific threshold (National Collaborating Centre for Mental Health, 2011). Collaborative multi–professional care has been shown to be an important element for appropriately handling mental (Archer et al., 2012, Coventry et al., 2014) and somatic illnesses (van Eck van der Sluijs et al., 2018) in patients with mental–somatic multimorbidities.

SCCMs combine these two concepts and have been introduced in various countries and health care settings. The heterogeneity of the SCCMs implemented in a range of countries coupled to contextual specificities, does currently not allow concluding on standard and best implementation modalities of SCCMs for managing mental health problems. Yet, a successful embedment in routine health service provision requires a range of aspects to be considered as observed in implementation research. Implementation research gives insights into the factors affecting the implementation in a real world setting (Peters et al., 2013). For instance, in a German project a major difficulty to implement a SCCM model

within primary care was collaboration across a regionally wide-spread network (Maehder et al., 2021). Co-location of somatic and mental health specialists in the same working place (Overbeck et al., 2016, Wood et al., 2017) is valuable to reach integrated care (Heath et al., 2013) and can help handling mental health conditions in somatic settings. Further, general hospitals in the United Kingdom successfully implemented routine depression and anxiety screenings in some specialties (Rayner et al., 2014). However, structural factors, such as the ward organization or staff availability, were factors impeding the mental health screening (Rayner et al., 2014).

Here, we report insights from a recent project conducted in a general hospital setting in Switzerland. SomPsyNet is a healthcare project for SOMatic inpatients to prevent PSYchosocial stress consequences by establishing a stepped and collaborative care NETwork in the canton of Basel-Stadt (Clinicaltrials.gov, Schaefert et al., 2021). The SCCM implemented by SomPsyNet aims to improve the quality of life of patients with mental–somatic multimorbidities (Clinicaltrials.gov, Schaefert et al., 2021). First, ward physicians and nurses as well as patients themselves independently assess the patient's psychosocial distress using a distress thermometer, which has been adapted from the commonly used distress thermometer in oncology (Ownby, 2019). The score is recorded in each patient's electronic file; hospital information technology (IT) systems were adapted accordingly. Second, all patients are comprehensively screened for depressive, anxiety, and distressing somatic symptoms using validated and reliable assessment tools. The two-step screening shall be completed within the first 72 hours of hospitalization. If patients are distressed according to the two-step screening, they are offered a psychosomatic consultation providing them clinical assessment and appropriate treatment recommendations according to stepped care. To support the implementation of the first step of the SCCM, each ward had one face-to-face training. Additionally, an online training course was created to introduce SomPsyNet and the SCCM to healthcare professionals.

Organizational changes and the introduction of new systems such as the SCCM are challenging regarding various aspects. Two systematic reviews have summarized structural, financial, and individual barriers to integrating mental health in primary care

settings (Overbeck et al., 2016, Wakida et al., 2018). Leadership, reimbursement, and motivation represented important determinants of integration success (Overbeck et al., 2016, Wakida et al., 2018). Yet, evidence of the facilitators and barriers encountered when SCCMs are implemented in hospital settings is lacking. Thus, we aimed to assess the facilitators and barriers of the psychosocial distress assessment implementation, which represents the first step of the SCCM in Basel-Stadt. We structured this study around a framework widely used in implementation research, the Tailored Implementation for Chronic Diseases (TICD) framework.

Methods

Study setting

Three hospitals in the canton of Basel-Stadt started the SomPsyNet study in 2020. While the University Hospital Basel and the University Department of Geriatric Medicine FELIX PLATTER are public hospitals including close collaboration with teaching and research, the Bethesda Hospital is a private hospital focusing on gynecology, rheumatology, and rehabilitation. With 37,108 inpatients being discharged in 2020 (Universitätsspital Basel, 2021), the University Hospital Basel is the largest participating hospital. In comparison, the University Department of Geriatric Medicine FELIX PLATTER and the Bethesda Hospital had 5,143 and 6,108 discharged inpatients, respectively, in 2020 (Bethesda Spital AG, 2021, Universitäre Altersklinik FELIX PLATTER, 2021).

Study sample

The study sample consisted of nurses and physicians of all participating hospitals working in different specialties: internal medicine, gynecology, rehabilitation, rheumatology, and geriatric rehabilitation / acute geriatrics. To get insights into the facilitators and barriers of the SomPsyNet implementation, nurses and physicians differing in age and gender participated in the interviews. Sampling relied on a purposive sampling representing

health professionals with different socio-demographic characteristics and holding different roles and responsibilities in respect to the SCCM. All interviewees participated in the SomPsyNet implementation. After a first set of interviews in 2020 conducted to evaluate the perceived importance of and experiences with mental health in hospital settings focusing on somatic health conditions (Aebi et al., 2021), NJA contacted the same interviewees in 2021 by email (N = 18). Interviewees who did not work on a ward implementing the SCCM anymore or were not interested to be re-interviewed were replaced with new interviewees suggested by hospital ward line managers. Given the high time pressure in the hospital settings studied, we decided to conduct individual interviews rather than focus groups as assembling up to ten doctors or nurses for focus group discussions was not feasible.

TICD framework

Following an implementation research approach, the TICD framework by Flottorp et al. (2013) was used to clearly structure reported facilitators and barriers of the psychosocial distress assessment within the SCCM. This framework contains 57 potential determinants, which are grouped into seven domains: guideline factors, individual healthcare professional factors, patient factors, professional interactions, incentives and resources, capacity for organizational change, and social, political, and legal factors. These determinants are based on a literature review of twelve checklists, representing a comprehensive checklist to facilitate implementation research. The TICD framework was initially established and validated for health service interventions focusing on patients with chronic diseases in primary healthcare, but has also been applied in acute care settings (Skolarus et al., 2019) and long-term care (Lescure et al., 2021) covering various diseases including mental health (Hoffmann et al., 2020, Poß-Doering et al., 2021).

Data collection

The interview guide was based on the TICD framework (see Appendix 3). Before starting the interviews, NJA (female epidemiologist with experience in qualitative research; PhD Candidate working for the external evaluation team) pilot tested the interview guide with a former member of the SomPsyNet project team. Between May 26, 2021, and September 2, 2021, NJA conducted all semi-structured interviews, in either Swiss German or German, depending on the interviewees' preferences. The interviews took place face-to-face at the workplace of the interviewee or via video-communication due to the COVID-19 pandemic, depending on the interviewee's preference. To the best of our knowledge, no other people were around during the interviews. NJA conducted interviews until no new information emerged. The interviews were audio-recorded and transcribed verbatim.

Data analysis

Content analysis was done in NVivo 12 (QSR International Pty Ltd., 2018) using the framework method by Gale et al. which conceives the analysis of qualitative analysis along seven steps: 1) transcription, 2) familiarization with the interview, 3) coding, 4) developing a framework, 5) applying the framework, 6) charting data into a framework matrix, and 7) interpreting the data (Gale et al., 2013). After transcription of the interviews, NJA familiarized herself with the content by multiple reading of the transcripts. Then, NJA deductively coded the interviews by applying the TICD framework. The TICD domains were split into determinants (themes and subthemes) that were used for line-by-line coding. Decisions were made using the definitions of TICD determinants provided by Flottorp et al. (Flottorp et al., 2013). Figure 5.1 displays an example of the subtheme "compatibility" within the TICD domain "professional factors". Example quotes for each TICD determinant mentioned by the interviewees are presented in S1 Table. Afterwards, the data was charted in a data matrix. A summary of each TICD determinant (column) was written for each interviewee (row) and linked to illustrative quotes. This data matrix helped to interpret the data and write a memo for each TICD domain including the

identified facilitators and barriers. Additionally, detailed researcher notes and discussion with NJA's supervisor (KW) supported the analysis and interpretation of the interviews and thus, the rigor of the research, during the analysis. Due to the limited time resources of the interviewees, we did not share the transcripts or findings with the interviewees. NJA translated the example quotes from German to English. The Consolidated Criteria for Reporting Qualitative Research (COREQ-32) guided the reporting (Tong et al., 2007).

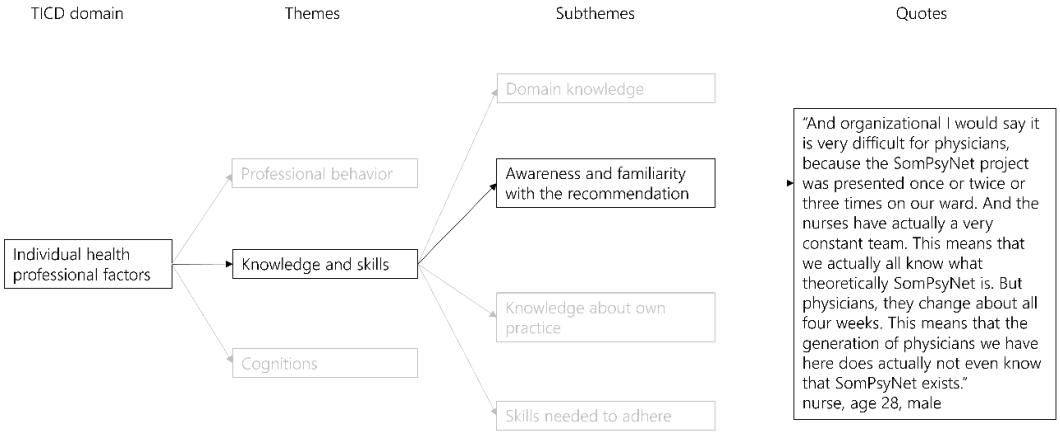

Figure 5.1 Example of the analysis applying the TICD framework.

Ethical considerations

The Ethics Committee Northwest and Central Switzerland (Ethikkomission Nordwest- und Zentralschweiz; EKNZ) approved this implementation study (ID Req-2019-01219). All interviewees gave written informed consent.

Results

Ten nurses and eight physicians participated in the interviews. Three nurses knew the interviewer (NJA) from a first interview in 2020 while 15 interviewees, replacing others who could not be re-interviewed, did not know her. Table 5.1 shows average interviewee characteristics. The mean age of the interviewed nurses was higher than the one of the

physicians, which translates into a longer professional experience. Further, we conducted more interviews with female than with male nurses who worked in various departments at the three included hospitals. The interviews lasted on average 29 min (range 20 – 44 min).

Table 5.1 Demographic characteristics of the interviewees, affiliated institutions, and interview duration (N = 18).

Characteristics of interviewees	Physicians (*n* = 8)	Nurses (*n* = 10)
Age [years]		
Mean (standard deviation = SD)	29.6 (3.5)	37.3 (10.8)
Range	26 – 35	23 – 56
Sex		
Female	4	8
Male	4	2
Time in profession [years]		
Mean (SD)	1.8 (1.1)	12.1 (8.9)
Range	0.75 – 4	4 – 34
Affiliated institution		
University Hospital Basel	3	3
University Department of Geriatric Medicine FELIX PLATTER	2	3
Bethesda Hospital	3	4
Department		
Rehabilitation/Rheumatology	1	2
Internal Medicine	3	3
Gynecology	2	1
Geriatrics	2	4
Interview duration [minutes]		
Mean (SD)	25.1 (4.3)	33.2 (8.0)
Range	20.4 – 32.2	22.1 – 44.1

Interviewees mentioned facilitators and barriers in all seven TICD domains. Capacity for organizational change and social, political, and legal factors were discussed less

comprehensively than factors from other domains. Table 5.2 presents an overview of the facilitators and barriers cited by the interviewees. We provide a summary of all TICD domains in the following paragraphs. Additionally, Appendix 4 shows example citations of each determinant.

Table 5.2 Overview of facilitators and barriers within the Tailored Implementation for Chronic Diseases (TICD) domains.

TICD domain	Facilitators	Barriers
Guideline factors	• alignment to existing process • accessibility in IT system • well-tailored to most patients	• subjectivity of assessment • missing observability of benefits • time-consuming patient discussions
Individual healthcare professional factors	• sufficient knowledge and skills about psychosocial distress • no change to routine processes • adaptability to daily routines possible	• missing awareness of healthcare professionals about the SCCM • high turnover / fluctuation of physicians • subjectivity impedes personal motivation
Patient factors	• value holistic care approaches	• missing capability to express specific patient needs • changes of emotional well-being during hospital stay
Professional interactions	• underlined team work • no change in referral processes between wards and psychosomatic services	• interest of senior physicians • alignment to other healthcare professionals' assessment
Incentives and resources	• required resources are available • financial benefits for patients and healthcare system (efficiency gains)	• absence and insufficiency of continuing training offers • missing reminders about execution of assessment • missing objective tool
Capacity for organizational change	• supportive leadership • feedback on adherence	• missing feedback on correctness of assessment • low priority of assessment within routine procedures
Social, political, and legal factors	• interest of various stakeholders	• stigma of mental health conditions

Guideline factors

The guideline factors domain covers information on the guideline's clarity, feasibility, compatibility, and effort. The psychosocial distress assessment was perceived to be well integrated into the daily routines, including the preexisting IT system. Interviewees described the assessment as a good complement to existing tools focusing more on somatic health in general hospitals. Interviewees considered the psychosocial distress assessment within the SCCM worthwhile except for those patients staying only shortly in the hospital, where patient safety is of highest priority (e.g., surgery patients).

> *"But I think with women who have recently given birth, I get to personal things much more quickly […]. With other patients who have surgery, I do not have to explain and say and talk that much. There, I rather make sure that the safety is guaranteed."* nurse, age 49, female

The psychosocial distress assessment also faced several barriers falling in this domain. In contrast to the entire SCCM, the psychosocial distress assessment was mentioned to lack an evidence-base. It was perceived to rely on personal rating, or "gut feeling". Together with the missing ability to observe immediate benefits for patients, healthcare professionals' motivation to assess psychosocial distress was limited. Still, they indicated their sensitivity and awareness to mental health conditions among patients had increased. Additionally, discussions with patients about their physical, emotional, and social well-being was thought to be time consuming. Indeed, the SCCM implied additional tasks for physicians and nurses in a context of already preexisting high workload. Some interviewees mentioned that they had appraised patients' mental health without using a structured approach and a particular score prior to the SCCM introduction. Therefore, the additional workload is limited:

> *"Well, basically, we as gynecologists – of course, this is special – we are always involved, psychosocially as well. So, this means that not much changed for us."* physician, age 29, male

Individual healthcare professional factors

The individual healthcare professional factors domain provides information on healthcare professionals' knowledge, skills, attitudes, and behaviors related to the guideline use. The general knowledge on reasons and consequences of psychosocial distress and skills of healthcare professionals (e.g., empathy, conversational skills, attention to recognize psychosocial distress signs and symptoms) facilitated the psychosocial distress assessment. Its integration into the admission interview with patients allowed assessing possible correlates for psychosocial distress without major changes in routines. On some wards, minor changes supported the integration of the psychosocial distress assessment into daily routine (e.g., electronic notes in patient file).

> *"[…] and we make notes that this is already done. This means, everybody sees that it is already done. And if the note is missing, then, you know that you still have to do it and particularly pay attention to it in patient care."* nurse, age 46, female

However, the perceived subjectivity in judgments within the assessment tool impeded the healthcare professionals' motivation to assess patients' psychosocial distress, leading to improper scoring of psychosocial distress. This was emphasized by the reported uncertainty about the accuracy of the healthcare professionals' assessment. Further, interviewees lacked information about the SCCM. Interviewees mentioned that the high turnover rate of physician negatively affected the awareness of the assessment. Various physicians only learned about the SCCM including the psychosocial distress assessment accidentally without a more comprehensive understanding of its rationale.

> *"Initially, all of us were a bit annoyed that we also have to do this in addition and do not know for what and why. This is an issue that you do not 'SomPsyNet – ah cool', but 'again one more'. Simply because we do not have background information."* physician, age 26, female

Patient factors

Patient factors, such as their needs, behavior, or motivation, play an essential role in guideline implementation. According to most interviewees, the psychosocial distress assessment depended on the patient's personality. Interviewees described that patients value holistic care and are open to principles and ideas of the SCCM, which increased healthcare professionals' motivation to assess psychosocial distress.

Nevertheless, the assessment of psychosocial distress was difficult to conduct with introvert patients, patients with cognitive impairments, or language barriers. Interviewees indicated that changes in the patients' well-being might depend on the day or time healthcare professionals assess the patient's psychosocial distress.

> *"[…] you see a patient for a day and the patient maybe he is having a good or a bad day. And then, you, as physician, give any number. And I feel that this can vary quite a bit."* physician, age 29, female

Professional interactions

Overall, the professional interactions domain is particularly interested in the team and referral processes. Already before the start of the SCCM, interprofessional collaboration was part of daily routines, especially in two smaller hospitals where good communication was highlighted. For instance, interprofessional meetings or collaborations with social workers or mental health specialist were reported to be helpful. Referral processes (e.g., between wards and psychosomatic medicine) were already in place and did not change with the SCCM introduction.

Nonetheless, mainly resident physicians mentioned that they were influenced by their senior physician's interest in psychosocial distress. If seniors are not interested and do not recognize the relevance of this area, juniors do not adhere to the psychosocial distress assessment.

"Maybe it depends on the senior physician one is working with. If he/she is open for such things or not." physician, age 35, male

Although nurses and physicians do not exchange views on the assessment as such, they stated that they sometimes adjust their assessment to the one who assessed the patient's psychosocial distress first.

Incentives and resources

Any incentives and resources like education, equipment, financial and human resources affecting the guideline implementation are part of the incentives and resources domain. Whereas resources such as IT systems and necessary support were available, this was not the case regarding the time needed to interact with patients. Additionally, interviewees mentioned that patients and the healthcare system at large could benefit financially from the systematic patient assessment because this could enable better psychosocial distress identification and management, leading to better treatment outcomes. Healthcare professionals themselves do not have financial or reputational incentives for assessing psychosocial distress.

Still, interviewees reported major barriers regarding the incentives and resources domain. While nurses would like to receive repeated trainings to raise awareness on the model again, physicians' main criticism was the lack of training in general. This might be related to the physicians' turnover rate, which is causing physicians to miss out the online training offered on the SCCM. Reminders could raise awareness in the IT system, which was proposed by some interviewees. Last, interviewees emphasized the preference for an objective assessment. Receiving specific questionnaires or checklists including what to look for would help to increase the quality of the psychosocial distress assessment and the motivation to carry out the assessment.

Capacity for organizational change

The capacity for organizational change domain covers the capacity to implement changes in a specific setting. Interviewees emphasized the importance of supporting leadership, be it by the hospital or ward managers. Some ward managers increase awareness and motivation through personal reminders. Receiving feedback on coverage and correctness of the psychosocial distress assessment by the SomPsyNet project team or the hospital management could enhance healthcare professionals' awareness and motivation further.

> *"[…] Or like an interim analysis like 'hey, you did a great job, somehow of the 300 patients you have cared for in the last five weeks, 20% were completed. The goal is to accomplish 40% until I come back in three weeks. And one can somehow see the progress a bit."* nurse, age 28, male

Healthcare professionals mentioned no consequences in the instance of missing assessments. This mirrored the perceived low priority of the psychosocial distress assessment within somatic medicine, which reflects an important barrier.

> *"Well, I believe that if one thinks with the biopsychosocial model: if one improves the psychosocial side, then, the biological, somatic side will improve automatically. And I think, unfortunately, we ignore this a bit in the somatic medicine."* physician, age 31, male

Social, political, and legal factors

The social, political, and legal factors domain includes determinants outside the respective setting needed to strive for changes like the implementation of a psychosocial distress assessment. Interviewees mentioned stigma related to poor mental health negatively affected the SCCM implementation. However, influential people like politicians, the funders, the project team, and external mental health specialists might be interested in the early detection and adequate psychosocial distress treatment to improve patients'

quality of life, reduce health care costs, and establish a network of various important stakeholders.

Discussion

This implementation study explored different facilitators and barriers related to the introduction and operation of a psychosocial distress assessment by physicians and nurses within a SCCM in a Swiss general hospital setting. While integrating the assessment in preexisting IT systems and daily processes (e.g., admission interview) at the hospital supported the introduction, major barriers were identified in the domains of guideline factors, individual healthcare professional factors, and incentives and resources.

Integrating patients' psychosocial distress assessment into preexisting hospital processes and IT systems reduced additional staff efforts. Integrated IT systems also fostered the collaborative care implementation in somatic health settings in previous studies (Wood et al., 2017). The possibility to tailor processes to the specificities of wards may increase the motivation to assess patients' psychosocial distress. Adaptability enhances commitment, and thus, sustainability (Blasinsky et al., 2006). Further, leadership support fosters commitment of staff members (Wood et al., 2017) as observed in our study.

Interviewees questioned the usefulness of a psychosocial distress assessment tool that is based on subjective judgment and "gut feeling", although intuition plays an important role in clinical settings (Van den Brink et al., 2019), especially for nurses (Holm and Severinsson, 2016). The intuitive conclusions need to be corroborated by objective assessments as proposed by a previous study (Van den Brink et al., 2019), which is important, as shown in delirium research, where subjective assessments are associated with misclassifications (Guenther et al., 2012). This explains the interviewees' desire to increase objectivity and standardization with examples, checklists, or questionnaires and thus, support the psychosocial distress assessment.

Additionally, insufficient knowledge about and awareness of mental health has been described in several studies (Aebi et al., 2021, Wakida et al., 2018). Mainly physicians mentioned lack of awareness of and familiarity with the psychosocial distress assessment and the entire SCCM. One important reason for particularly junior physicians highlighting this may be their frequent rotation in general hospitals, which made adequate information about the assessment and the SCCM a challenge. This may hinder its sustainability as observed in another implementation study in mental health (Woltmann et al., 2008).

Lastly, time constraints are widespread when implementing integrated care (Overbeck et al., 2016, Wakida et al., 2018, Sorensen et al., 2016), and healthcare professionals face many competing priorities. Typically, the focus on somatic health is to the detriment of mental health conditions (Aebi et al., 2021, Overbeck et al., 2016, Wakida et al., 2018). The psychosocial distress assessment was perceived to be of low priority in general hospitals, negatively affecting the SCCM implementation including the patient assessment. This might be reinforced by missing observability of the assessment's benefits on healthcare professionals' daily work or the senior physician's potential lack of interest.

Strengths and limitations

This study adds value to implementation science in general hospital settings by highlighting important facilitators and barriers of a time-constraint setting that have to be accounted for when implementing routine psychosocial distress assessment. The inclusion of three different hospitals and different wards increases the generalizability of the findings. However, the findings may not apply to wards with short hospital stays, such as surgical wards or emergency departments.

Some limitations need to be considered when interpreting the findings. First, the recruitment strategy may have led to limited views on the SCCM and its first step, the psychosocial distress assessment. The view of participating nurses and physicians may differ from other healthcare professionals' views. Nonetheless, the interviewees mentioned major critical factors. Second, interviewees may give socially desirable

answers. Letting healthcare professionals choose the interview location and mentioning the opportunity to suggest improvements may have reduced this bias. Further, some interviews were of comparatively short duration due to multiple competing tasks of the interviewees, limiting the possibility to cover topics of interest in-depth. To counteract this, we shared topics of interest and the interview guide ahead of the interview. Third, not the entire SCCM had been implemented at the time of the interviews. Only one physician had initiated a consultation with a mental health specialist because of the SCCM, at the time of the interview. Therefore, we can only conclude on the subjective psychosocial distress assessment by the healthcare professionals and not on subsequent consultations for mental conditions. Fourth, this study only includes the healthcare professionals' opinions and not those of patients, mental health specialists, or hospital management. Insights on the patient factors, capacity for organizational change, and social, political, and legal factors domains are limited. Finally, we used a deductive approach, which allowed structuring the analysis of facilitators and barriers as observed by other implementation research. This reduces the likelihood of identifying new themes. However, the analysis captured new factors such as the turnover rate relevant in acute care settings already mentioned by others (Skolarus et al., 2019).

Implications for practice and future research

Based on the Expert Recommendations for Implementing Change (ERIC) compilation (Powell et al., 2015), we propose several approaches to overcome the three most important barriers observed in our psychosocial distress assessment implementation as part of an SCCM in general hospital settings.

Checklists and examples should be made available so to make psychosocial distress assessments more consistent across healthcare professionals. For the assessment to be sustainable, healthcare professionals need to be aware of the benefits to their patients and why a psychosocial distress assessment is necessary (Blasinsky et al., 2006, Knowles et al., 2013, Overbeck et al., 2016), even if it is subjective. This can be achieved through

regular personal training, e.g., offered for healthcare professionals starting a new position, particularly important in settings with a high turnover rate. The training should clearly demonstrate the evidence base and the required action to assess psychosocial distress. Clear guidance coupled with repeated training may promote standardized approaches and thus, reduce subjectivity in the assessment. Additionally, readily available online training should be easily accessible, for instance by linking the training to the assessment in the patient file. Educational strategies are widely used (Pereira et al., 2022) and seem to positively affect care, patient health, and health systems in nursing (Cassidy et al., 2021) and particularly when implementing collaborative care into somatic health care settings (Wood et al., 2017). Further, reminders integrated directly to the IT system increase the awareness and save time.

In this time sensitive setting, the interviewees reported low priority of the patient's psychosocial distress assessment. Especially physicians emphasized thereby the importance of the senior physician's interest in mental health. Senior physicians should act as champions or opinion leaders who support the implementation and positively influence the SCCM uptake. Other research saw that physician champions helped the implementation of collaborative care into primary care (Overbeck et al., 2016).

The results of this study were shared and discussed with the SomPsyNet project team. They will complement quantitative data, e.g., the percentage of patients who were assessed for psychosocial distress by physicians and nurses, and will altogether support tailoring the SomPsyNet intervention to implementation realities. For instance, the provision of the psychosocial distress assessment could be restricted to only one healthcare professional.

Future research should focus on three main aspects. First, staff turnover was important in an emergency department study using the TICD (Skolarus et al., 2019). We agree with the authors that this is a major determinant in a hospital setting in general. Future implementation research should therefore focus on how implementation can be guaranteed despite high turnover rates and how barriers related to the turnover rate can

be sustainably overcome to better recognize mental health and see SCCM as part of hospital operations.

Second, we found that literature on how healthcare professionals perceive subjective assessments of patients' mental health is scarce. While our findings show that objective assessments are preferred to subjective ones, we suggest investigating experiences of different healthcare professionals in different settings to better understand the reasons for this.

Third, other stakeholders' perspectives are essential, particularly those of patients. Other research has found that patients wish to separate mental and somatic health spatially (Knowles et al., 2015, Wood et al., 2017). An additional barrier for psychosocial distress assessment was the perceived stigmatization (Ohanyan et al., 2021). These factors may impede the mental health project implementation in general hospitals. Hence, research should focus on patients' experiences with and preferences about integrating mental health into somatic settings.

Conclusion

Subjectivity of the assessment, lack of awareness due to high turnover rates, and low priority of the assessment due to time constraints posed major challenges when implementing a psychosocial distress assessment of patients admitted to general hospitals, especially for physicians. We suggest providing regular training for new employees, providing feedback on healthcare professional performance and the observed patient benefits, and appointing champions or opinion leaders to address these challenges in implementing a routine assessment for mental health in general hospitals. Furthermore, the integration of the psychosocial distress assessment into current hospital processes and systems is a necessary factor to facilitate the implementation in a time-constrained setting.

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CHAPTER 6

Association of different restriction levels with COVID-19-related distress and mental health in somatic inpatients: a secondary analysis of Swiss general hospital data

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ASSOCIATION OF DIFFERENT RESTRICTION LEVELS WITH COVID-19-RELATED DISTRESS AND MENTAL HEALTH IN SOMATIC INPATIENTS: A SECONDARY ANALYSIS OF SWISS GENERAL HOSPITAL DATA

Abstract

Introduction

The coronavirus disease 2019 (COVID-19) pandemic and related countermeasures hinder health care access and affect mental well-being of non-COVID-19 patients. There is lack of evidence on distress and mental health of patients hospitalized due to other reasons than COVID-19 – a vulnerable population group in two ways: First, given their risk for physical diseases, they are at increased risk for severe courses and death related to COVID-19. Second, they may struggle particularly with COVID-19 restrictions due to their dependence on social support. Therefore, we investigated the association of intensity of COVID-19 restrictions with levels of COVID-19-related distress, mental health (depression, anxiety, somatic symptom disorder, and mental quality of life), and perceived social support among Swiss general hospital non-COVID-19 inpatients.

Methods

We analyzed distress of 873 hospital inpatients not admitted for COVID-19, recruited from internal medicine, gynecology, rheumatology, rehabilitation, acute geriatrics, and geriatric rehabilitation wards of three hospitals. We assessed distress due to the COVID-19 pandemic, and four indicators of mental health: depressive and anxiety symptom severity, psychological distress associated with somatic symptoms, and the mental component of health-related quality of life; additionally, we assessed social support. The data collection period was divided into modest (June 9 to October 18, 2020) and strong

(October 19, 2020, to April 17, 2021) COVID-19 restrictions, based on the Oxford Stringency Index for Switzerland.

Results

An additional 13% (95%-Confidence Interval 4% to 21%) and 9% (1% to 16%) of hospital inpatients reported distress related to leisure time and loneliness, respectively, during strong COVID-19 restrictions compared to times of modest restrictions. There was no evidence for changes in mental health or social support.

Conclusions

Focusing on the vulnerable population of general hospital inpatients not admitted for COVID-19, our results suggest that tightening of COVID-19 restrictions in October 2020 was associated with increased COVID-19-related distress regarding leisure time and loneliness, with no evidence for a related decrease in mental health. If this association was causal, safe measures to increase social interaction (e.g., virtual encounters and outdoor activities) are highly warranted.

Trial registration

This is an observational study using data from a trial registered as ClinicalTrials.gov NCT04269005.

Introduction

Coronavirus disease 2019 (COVID-19) can interfere with health care delivery, and negatively affect mental health (Brooks et al., 2020, Chiesa et al., 2021, Santomauro et al., 2021a). Beyond SARS-CoV-2 infections, impeded health care for non-COVID-19 patients is a major threat (Bodilsen et al., 2021). During the first wave of the COVID-19 pandemic, limited access to health care was reported (Chiesa et al., 2021, Grimshaw and Chaudhuri, 2021, Moser et al., 2020). Despite the decrease of admissions to hospitals, admissions due to mental health issues raised in the United Kingdom (Grimshaw and Chaudhuri, 2021). Therefore, elucidating distress and mental health of hospital inpatients not admitted for COVID-19 is of paramount importance. Poor mental health is further associated with chronic diseases (Xiong et al., 2020). Thus, different calls for research on the vulnerable population of individuals with chronic diseases were published (Holmes et al., 2020, Kuper and Shakespeare, 2021). This research should also include hospital inpatients presenting with various somatic diseases, such as diseases related to internal medicine, gynecology, rheumatology, rehabilitation, geriatrics, and others. This population is specifically vulnerable for COVID-19 and severe courses including mortality (given the risk factors: physical disease and older age), and for not sufficiently seeking or receiving health care for non-COVID-19 related physical illness (which per definition all of them have). However, studies on distress and mental health of hospital inpatients not admitted for COVID-19 are missing, whereas evidence from studies focusing on populations with chronic diseases remains inconclusive, as was also found in a systematic review comparing the mental health impact of COVID-19 on vulnerable and non-vulnerable groups (Nam et al., 2021). While some studies suggest increased prevalence of depression, anxiety, and distress (Feter et al., 2021, Smith et al., 2020), others report no indications for an association between mental health and the COVID-19 pandemic on people with pre-existing chronic disease (Budu et al., 2021, Louvardi et al., 2020). However, most of the present literature is cross-sectional focusing on one point or period in time. The few longitudinal studies available to date report either small or no associations of COVID-19 restrictions with mental health outcomes in the general population (Prati and Mancini, 2021, Voltmer et

al., 2021). Although evidence for the population of hospital inpatients not admitted for COVID-19 is missing, the inconsistent results regarding the association of COVID-19 restrictions with mental health may result from a combination of negative effects of the COVID-19 pandemic in some sub-groups, together with positive effects of the COVID-19 pandemic on quality of life and social support in other sub-groups. For instance, in countries such as the United Kingdom, the United States, and New Zealand people had the ability to save money due to lower consumption levels and lower risk of job loss (Stallard et al., 2021), more flexibility at work, and less commuting (Jenkins et al., 2021), allowing for more time for personal growth, family and close friends (Jenkins et al., 2021, Kowalski et al., 2021, Stallard et al., 2021).

Social networks are a protective factor against depression, anxiety, and other mental health problems (Gloster et al., 2020). Social support from family and friends may have helped to prevent and address mental health symptoms, which occurred during the COVID-19 pandemic (Rodríguez-Fernández et al., 2021). Between June and October 2020, modest COVID-19 restrictions (the mean Oxford Stringency Index, which ranges from 0 to 100, was 39.1 in Switzerland) allowed maintaining social contacts in Switzerland. However, stronger COVID-19 restrictions (mean Oxford Stringency Index in Switzerland was 63.4) introduced in October 2020, such as home office and restrictions in leisure activities, may have impeded social contacts and likely, mental health. Lack of a social network may have impaired mental health, especially during quarantine and isolation (Henssler et al., 2021, Morina et al., 2021). Moreover, in the United States personal distancing was associated with more mental health symptoms, independent from stay-at-home orders (Marroquín et al., 2020). A Swiss study conducted at an emergency department reported fewer admissions due to suicidal behavior during lockdown as compared to after the lockdown (Ambrosetti et al., 2021). This finding was supported by a meta-analysis of longitudinal studies that did not find increased suicide rates during lockdown, which the authors explained by social cohesion (Prati and Mancini, 2021), highlighting the importance of social contacts, especially among vulnerable groups.

Taken together, social support seems to be an important protective factor for mental health, which may be compromised due to COVID-19 restrictions.

Therefore, our aim was to assess general hospital inpatients' COVID-19-related distress, mental health, and social support during periods of modest and strong COVID-19 restrictions defined by the Oxford Stringency Index. Based on the above mentioned finding that the COVID-19 pandemic was associated with poorer mental health outcomes in some populations and that COVID-19 restrictions may reduce social networks, we hypothesized that strong COVID-19 restrictions, as implemented in Switzerland from October 2020 to April 2021, were related to i) increased COVID-19-related distress, ii) poorer mental health outcomes, and iii) less social support in general hospital inpatients not admitted for COVID-19.

Methods

Study setting

We conducted this secondary analysis using prospective data collected as part of an ongoing clinical trial aiming at the early identification and management of elevated psychosocial distress among inpatients in three general hospitals in Basel, Switzerland. The SomPsyNet project includes patients from SOMatic hospitals with the objective to promote the prevention of PSYchological distress by establishing a stepped and collaborative care NETwork (NCT04269005) (Clinicaltrials.gov).

The Ethics Committee of Northwest and Central Switzerland approved the study protocol (2019–01724), including an amendment that contained COVID-19-related questions to assess the impact of the COVID-19 pandemic on psychosocial distress. All patients gave written informed consent.

Study population

Adult non-COVID-19 general hospital inpatients admitted for somatic health problems across nine hospital wards, including internal medicine, gynecology, rheumatology, rehabilitation, acute geriatrics, and geriatric rehabilitation, were eligible to participate in SomPsyNet. The following exclusion criteria applied: age below 18 years, not understanding/speaking German, not being able to give informed consent personally, not being able to follow the procedures of the study due to severe medical issues, risk of current suicidality or attempted suicide, and oncological conditions (due to existing standardized psycho-oncological care). Appendix 5 depicts a detailed flow-chart, emphasizing that most admitted hospital inpatients were either not eligible for SomPsyNet or refused to participate, reached the time limit, or left the hospital already.

Study design

We collected outcome data at baseline between June 9, 2020, and April 17, 2021. Within 72 hours after admission to the hospital, study staff asked hospital inpatients not admitted for COVID-19 enrolled in the SomPsyNet study to complete a detailed questionnaire. We collected data using the platform "Heartbeat One" (provided by Heartbeat Medical Solutions GmbH, Berlin, Germany).

We used the Oxford Stringency Index (ranging from 0 to 100) for Switzerland, provided by the *Konjunkturforschungsstelle* (KOF; Swiss Economic Institute) (Pleninger et al., 2021), to divide the study into two periods. This index is based on nine indicators including school/workplace closing, cancellation of public events, restrictions on gatherings, closure of public transport, stay-at-home requirements, restriction on internal movement, international travel controls, and public information campaigns (Pleninger et al., 2021). We determined the time point when the Swiss government added again COVID-19 restrictions after a period with modest restrictions to distinguish between a period with modest and a period with strong COVID-19 restrictions, October 19, 2020. As illustrated in Table 6.1, the initial recruitment period (June 9 to October 18, 2020) was characterized

by modest restrictions as the Swiss government had lifted most of the previous restrictions. Due to rising numbers of COVID-19 cases, the Swiss government imposed stronger restrictions again in October 2020, including restrictions on public gatherings and other leisure activities as well as closure of restaurants and non-essential stores. Also, there were restrictions in visitors' regulations at Swiss hospitals. These were hospital specific and varied in terms of timing and severity of implementation across the included hospitals.

Table 6.1 Overview of the coronavirus disease 2019 (COVID-19) restrictions in the study period from June 9, 2020, to April 17, 2021.

Modest COVID-19 restrictions (June 9, 2020 – October 18, 2020)	Strong COVID-19 restrictions (October 19, 2020 – April 17, 2021)
• Hygiene measures • Wearing masks • Quarantine after travels from countries with increased risk of infection • Prohibition of major events • Contact tracing	In addition to the ones of the previous period • Restrictions of social gatherings • Closure of restaurants, stores for non-everyday needs, and cultural venues (e.g. museums) • Home office obligation • Restrictions in leisure activities (e.g. prohibition of leisure activities with more than five people)

Variables

The survey contained questions on sociodemographic factors, general mental distress measures, COVID-19-related distress, and social support.

Patient characteristics

Patient characteristics included self-reported sex, age, nationality, marital status, education, and the somatic symptom severity assessed by the 8-item Somatic Symptom Scale (SSS-8). Age was grouped into <65 year-old hospital inpatients and those of ≥65 years. Nationality included Swiss, German, French, and Others, which consists of all other

nationalities and hospital inpatients with more than one nationality. Marital status was split into single, married, widowed, divorced, and other. Education level was separated into primary level or less, secondary level I, secondary level II, tertiary level, and other. The SSS-8 is validated in German and is a reliable tool to assess the somatic symptom severity, consisting of a five-point Likert scale (0-4), ranging from 0 to 32 (Gierk et al., 2014). To describe the sample, we categorized the hospital inpatients into a lower (score <16) and a higher (score ≥16) level of somatic symptom severity.

COVID-19-related distress

To determine specific distress related to the COVID-19 pandemic in different life areas, we asked hospital inpatients not admitted for COVID-19: "How distressed were you by the COVID-19 or corona pandemic in the past week regarding …: a) your economic/financial situation, b) your physical constraints, c) your nutrition/weight, d) alcohol/nicotine/other substances, e) insecurities/worries/anxieties related to health or medical treatment, f) your work/education/retirement, g) your private environment including family/(grand-)children/childcare/living situation and others, h) your leisure activities/restrictions of personal freedom or others, i) your loneliness, and j) your emotional problems, such as sadness, depression, anxiety." We derived these life areas from the monitoring of the impact of the COVID-19 pandemic on the Swiss general population conducted by the research institute Sotomo (Bosshardt et al., 2020). The hospital inpatients not admitted for COVID-19 stated whether due to the COVID-19 pandemic, they were "substantially less distressed", "slightly less distressed", "neither less nor more distressed", "slightly more distressed", or "substantially more distressed". For this analysis, we created a binary indicator for distress severity of each life area combining the groups "substantially less distressed", "slightly less distressed", and "neither less nor more distressed" to indicate not distressed hospital inpatients, and the groups "slightly more distressed" and "substantially more distressed" to indicate distressed hospital inpatients.

Mental health

We assessed mental health through several validated and reliable tools: depressive symptom severity with the 8-item Patient Health Questionnaire (PHQ-8), anxiety severity with the 7-item General Anxiety Disorder questionnaire (GAD-7), psychological distress associated with somatic symptoms with the 12-item Somatic Symptom Disorder questionnaire (SSD-12), and mental quality of life with the mental component summary scale (MCS) of the Short Form 36, version 1 (SF-36v1) (Kroenke et al., 2009, Löwe et al., 2008, Toussaint et al., 2016, Ware and Gandek, 1998). The SSD-12 consists of a five-point Likert scale (0-4), with a total score ranging from 0 to 48 (Toussaint et al., 2016). PHQ-8 and GAD-7 are composed of a four-point Likert scale (0-3), with total scores ranging from 0 to 24 and 0 to 21, respectively (Kroenke et al., 2009, Spitzer et al., 2006). While higher scores in PHQ-8, GAD-7, and SSD-12 stand for worse mental health, a higher score in the MCS of the SF-36v1 represents better mental quality of life (Kroenke et al., 2009, Spitzer et al., 2006, Toussaint et al., 2016, Ware et al., 1993). For this analysis, we created binary variables for each mental health assessment tool indicating whether the patient was distressed or not. Aligning to other studies, we defined the cutoff for being distressed as follows: PHQ-8 score ≥ 10, GAD-7 score ≥ 10, SSD-12 score ≥ 23, and SF-36 MCS score ≤ 38 (Kroenke et al., 2009, Löwe et al., 2008, Matcham et al., 2016, Toussaint et al., 2020).

Social support

To assess social support of hospital inpatients not admitted for COVID-19, we used the Oslo Social Support Scale (OSSS-3). Following Bøen et al., we calculated sum scores ranging from 3 to 14 and categorized hospital inpatients not admitted for COVID-19 into receiving poor (3 to 8), moderate (9 to 11), or strong (12 to 14) social support (Bøen et al., 2012).

Statistical methods

The analysis was conducted using STATA/IC 15.1 including only hospital inpatients not admitted for COVID-19 with complete data. We considered p-values smaller than 0.05 to be statistically significant. We used heteroscedasticity-robust standard errors in all analyses in this study to allow for a non-normal residual distribution.

First, we compared the characteristics of the sample population recruited during modest COVID-19 restrictions (pre-period) and the sample recruited during strong COVID-19 restrictions (post-period).

Second, we graphed unadjusted average weekly percentage of hospital inpatients stating COVID-19-related distress and poor mental health over the full study period, comparing average levels during the modest (pre-period) and strong (post-period) COVID-19 restrictions.

Third, we formally tested the association of COVID-19-related distress, mental health, and social support between the two periods of modest and strong COVID-19 restrictions using multiple regression models. We stratified the linear regression model by sex and age group, and tested whether associations differed between sex and age groups. We conducted these analyses both, with binary and continuous outcomes, and estimated similar models for social support. All multiple regression models were adjusted for sex, age group, nationality, marital status, education level, weekly incidence of COVID-19 infections in the canton of Basel-Stadt, and the hospital the inpatients were admitted to.

Following Wagner et al. (Wagner et al., 2002), we also estimated interrupted time series (ITS) regression models as a sensitivity analysis for our main mental health outcomes (Appendix 6 and Appendix 7). The ITS model included a linear time trend, a post-term, and an interaction term between time and post-term. The post-term captured the average change over time (shift in intercept), while the interaction-term captured the change in trends.

Results

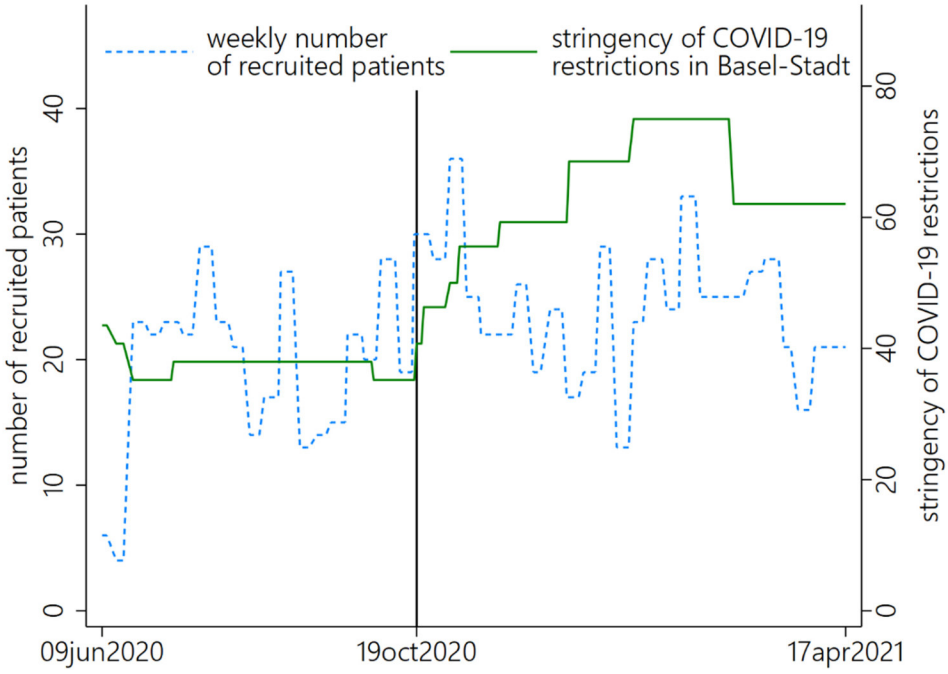

Figure 6.1 SomPsyNet recruitment (blue/dashed line) and stringency of coronavirus disease 2019 (COVID-19) restrictions in the canton of Basel-Stadt, Switzerland, (green/solid line) in the study period. The black line separates the periods with modest (pre-period) versus strong (post-period) COVID-19 restrictions.

Of 7547 hospital inpatients admitted to the nine hospital wards, we included 873 hospital inpatients with complete data in this study (Appendix 5), whereby 324 hospital inpatients were recruited in the period of modest COVID-19 restrictions and 549 hospital inpatients in the period of strong COVID-19 restrictions. Figure 6.1 depicts the recruitment numbers (blue/dashed line) and the stringency of COVID-19 restrictions (green/solid line) in the study area during the two study periods before (pre-period: modest restrictions) and after (post-period: strong restrictions) the tightening of COVID-19 restrictions. The sociodemographic characteristics of hospital inpatients not admitted due to COVID-19 were similarly distributed in the two periods with modest and strong COVID-19 restrictions, except for admitting hospital, and medical field in which hospital inpatients were treated (Table 6.2). Another exception was sex: during modest COVID-19 restrictions, the proportion of females was lower than during strong COVID-19 restrictions, which is

consistent with a marginally larger proportion of hospital inpatients not admitted for COVID-19 recruited at the level of the gynecology ward in the post-period period of strong COVID-19 restrictions.

Table 6.2 Patient characteristics, admitting hospital, and medical specialty of wards at which recruitment took place during modest (n=324) and strong (n=549) coronavirus disease 2019 (COVID-19) restrictions.

Characteristics	Modest restrictions (pre-period)		Strong restrictions (post-period)		p-value*
	n	%	*n*	%	
Sex					
Male	154	47.5	218	39.7	
Female	170	52.5	331	60.3	0.024
Age group					
<65 years	177	54.6	303	55.2	
≥65 years	147	45.4	246	44.8	0.872
Nationality					
Swiss	235	72.5	425	77.4	
German	23	7.1	46	8.4	
French	2	0.6	5	0.9	
Other	64	19.8	73	13.3	0.082
Marital status					
Single	74	22.8	134	24.4	
Married	165	50.9	266	48.5	
Widowed	36	11.1	62	11.3	
Divorced	44	13.6	79	14.4	
Other	5	1.5	8	1.5	0.966
Highest education					
Primary level or less	11	3.4	21	3.8	
Secondary level I	53	16.4	68	12.4	
Secondary level II	141	43.5	235	42.8	
Tertiary level	108	33.3	215	39.2	
Other	11	3.4	10	1.8	0.170
Somatic Symptom Severity (SSS-8)					
Lower level (<16)	269	83.0	459	83.6	
Higher level (≥16)	55	17.0	90	16.4	0.823
Hospital					
University Hospital Basel	195	60.2	362	65.9	

University Department of Geriatric Medicine FELIX PLATTER	12	3.7	38	6.9	
Bethesda Hospital	117	36.1	149	27.1	0.006
Medical field					
Internal Medicine	165	50.9	270	49.3	
Gynecology	70	21.6	130	23.7	
Rheumatology	38	11.7	31	5.7	
Rehabilitation	39	12.0	79	14.4	
Acute Geriatrics/Geriatric Rehabilitation	12	3.7	39	7.1	0.010

*comparison of modest and strong COVID-19 restrictions using Chi^2-test

Unadjusted models showed that COVID-19-related distress increased significantly in six of ten life areas in the post-period of strong COVID-19 restrictions (Figure 6.2). No differences were found in distress regarding hospital inpatients' financial situation, physical constraints, nutrition, and alcohol, nicotine and similar substances intake. However, the percentage of hospital inpatients reporting more distress due to COVID-19 increased between 8% (95%-Confidence Interval [CI] 2% to 14%) in the life area of health or medical treatment and 12.0% (5.6% to 18.5%) in the area of private environment (including childcare and living situation) during strong as compared to modest restrictions. Continuous results did not indicate a change in distress scores regarding work/education/retirement and emotional problems, such as sadness, depression, anxiety, from modest to strong COVID-19 restrictions (Appendix 8).

Results differed after multivariable adjustment. When adjusting for sex, age group, nationality, marital status, education level, weekly incidence of COVID-19 infections in the canton of Basel-Stadt, and the hospital the inpatients were admitted to, the models (Table 6.3) only showed significant differences regarding leisure time, loneliness, and emotional issues, such as depression, sadness, or fears. Additionally, distress regarding physical complaints increased among older hospital inpatients not admitted for COVID-19 during the post-period of strong compared to the pre-period of modest COVID-19 restrictions.

According to results from continuous data, only distress regarding leisure time increased significantly (Appendix 9).

Some sex and age differences regarding COVID-19-related distress were found (Appendix 10). A higher proportion of females indicated increased COVID-19-related distress regarding physical complaints and emotional issues during strong compared to modest COVID-19 restrictions. Further, older hospital inpatients not admitted for COVID-19 reported less COVID-19-related distress due to health and profession during the post-period of strong compared to modest COVID-19 restrictions.

In total, 33.0% of general hospital inpatients not admitted for COVID-19 experienced strong social support while 19.1% stated to have poor social support. The mean social support did not significantly differ between the periods with modest and strong COVID-19 restrictions, except for males (Table 6.3). Males reported stronger social support during the period of strong COVID-19 restrictions compared to the pre-period with modest COVID-19 restrictions. However, this difference by sex regarding social support could not be confirmed in the equal coefficient analysis as depicted in Appendix 10.

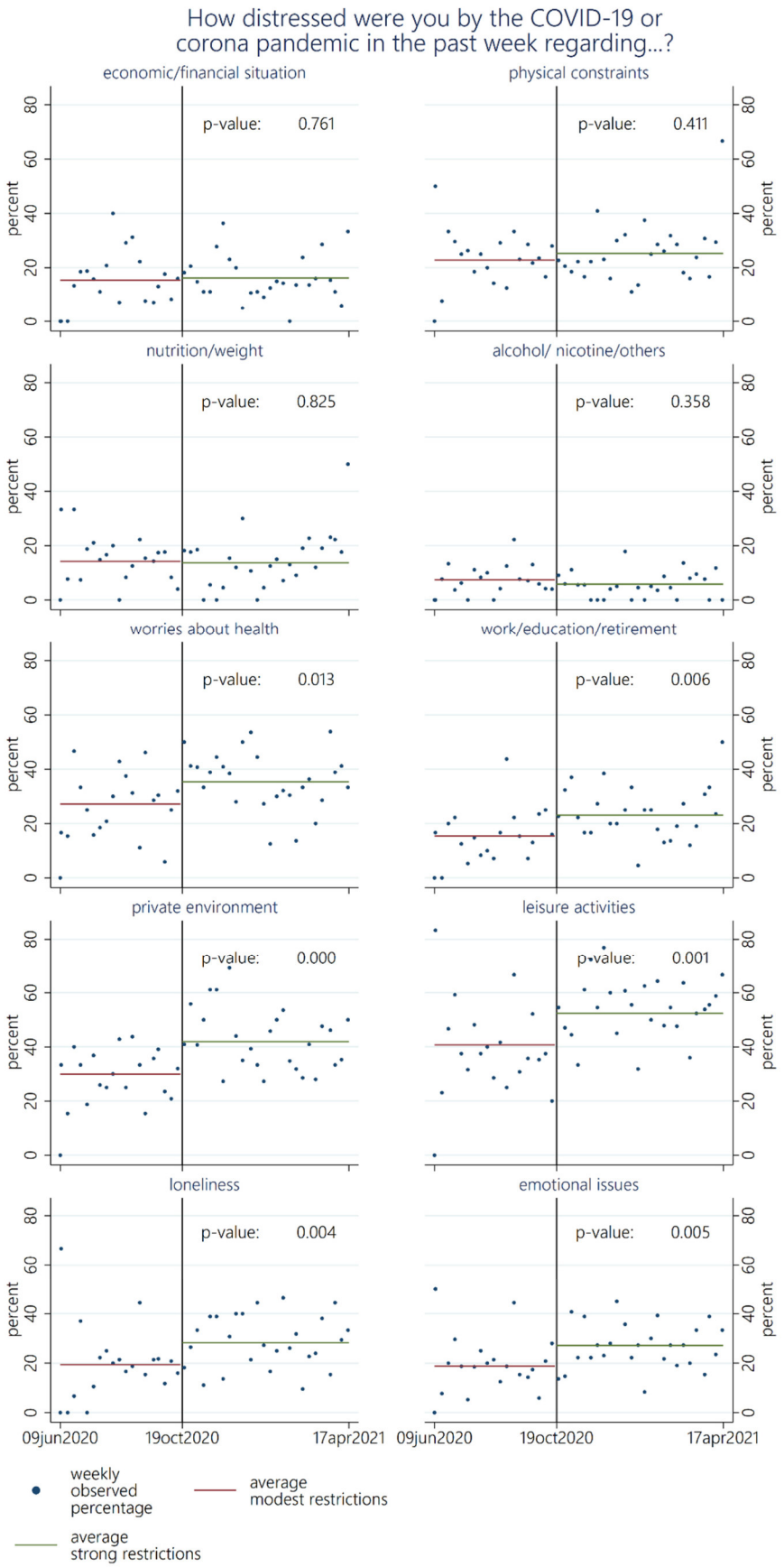
How distressed were you by the COVID-19 or corona pandemic in the past week regarding...?
economic/financial situation
p-value: 0.761
physical constraints
p-value: 0.411
nutrition/weight
p-value: 0.825
alcohol/ nicotine/others
p-value: 0.358
worries about health
p-value: 0.013
work/education/retirement
p-value: 0.006
private environment
p-value: 0.000
leisure activities
p-value: 0.001
loneliness
p-value: 0.004
emotional issues
p-value: 0.005
percent
0
20
40
60
80
09jun2020
19oct2020
17apr2021
weekly observed percentage
average modest restrictions
average strong restrictions

Figure 6.2 Comparison of weekly percentage of hospital inpatients stating being slightly or substantially more distressed due to the coronavirus disease 2019 (COVID-19) pandemic in the respective life area between the pre-period of modest and post-period of strong COVID-19 restrictions (N = 873). P-values are based on unadjusted linear regression analyses.

Table 6.3 Changes in the percentage of hospital inpatients reporting slightly or substantially more distress due to the coronavirus disease 2019 (COVID-19) pandemic in specific life areas and changes in perceived social support from periods of modest to strong COVID-19 restrictions, based on linear regression models, stratified by sex and age group (*N* = 873).

	Change in percentage of hospital inpatients reporting increased distress during the period of strong restrictions (95%-CI)				
	All	Male	Female	<65 years	≥65 years
Finances	-2.51 (-8.69 to 3.68)	-1.96 (-11.65 to 7.73)	-3.46 (-11.83 to 4.92)	-5.92 (-15.96 to 4.12)	2.77 (-4.52 to 10.06)
Physical complaints	4.46 (-3.10 to 12.02)	-3.00 (-15.14 to 9.14)	8.91 (-0.85 to 18.67)	-1.38 (-12.31 to 9.55)	11.72* (1.12 to 22.32)
Nutrition	2.28 (-4.04 to 8.59)	5.29 (-4.15 to 14.92)	-0.77 (-9.22 to 7.69)	-2.13 (-11.38 to 7.11)	7.80 (-0.93 to 16.53)
Alcohol, nicotine, others	-2.51 (-6.73 to 1.72)	-3.31 (-9.12 to 2.51)	-1.93 (-7.87 to 4.00)	-4.30 (-11.13 to 2.53)	0.16 (-4.27 to 4.59)
Worries about health	1.90 (-6.21 to 10.00)	-0.00 (-12.48 to 12.47)	3.36 (-7.54 to 14.27)	10.47 (-1.11 to 22.04)	-8.69 (-20.39 to 3.01)
Profession	4.41 (-2.21 to 11.04)	0.01 (-9.50 to 9.66)	6.90 (-1.90 to 15.71)	9.69 (-1.62 to 21.01)	-3.07 (-9.45 to 3.31)
Private environment	5.76 (-2.58 to 14.09)	5.49 (-7.23 to 18.21)	5.44 (-5.76 to 16.63)	8.83 (-3.02 to 20.68)	-1.28 (-12.97 to 10.41)
Leisure time	12.79** (4.09 to 21.48)	9.19 (-4.79 to 23.18)	14.68* (3.25 to 26.11)	10.08 (-1.95 to 22.11)	14.12* (1.10 to 27.13)
Loneliness	8.82* (1.27 to 16.38)	8.90 (-3.27 to 21.07)	8.74 (-1.23 to 18.71)	7.28 (-2.95 to 17.52)	11.40* (0.03 to 22.76)
Emotional issues	7.44 (-0.00 to 14.89)	2.01 (-9.13 to 13.15)	11.52* (1.24 to 21.79)	6.43 (-4.26 to 17.12)	9.10 (-1.34 to 19.54)
	Change in mean score of social support[§] (95%-CI)				
Social support (OSSS-3)	0.08 (-0.05 to 0.20)	0.21* (0.01 to 0.40)	-0.02 (-0.19 to 0.15)	0.08 (-0.10 to 0.26)	0.08 (-0.11 to 0.26)

Results are adjusted for sex, age group, nationality, education level, marital status, weekly incidence of COVID-19 infections in Basel-Stadt, and hospital.

* p-value < 0.05; **p-value ≤ 0.01; *** p-value ≤ 0.001

[§] Score from one (poor support) to three (strong support)

CI = Confidence Interval

OSSS-3 = Oslo Social Support Scale

There was no evidence for differences in the percentage of hospital inpatients reporting poor mental health between the pre-period with modest to the post-period with strong COVID-19 restrictions in unadjusted (Figure 6.3) and adjusted (Table 6.4) models. Results were comparable for mental health scores (Appendix 11 and Appendix 12) and highly consistent across all four mental health assessment tools with unadjusted mean scores of 16.8 (15.7 to 18.0), 6.6 (6.1 to 7.2), 5.3 (4.8 to 5.8), and 65.7 (63.4 to 68.0) for SSD-12, PHQ-8, GAD-7, and the MCS scale of SF-36v1, respectively, during modest COVID-19 restrictions.

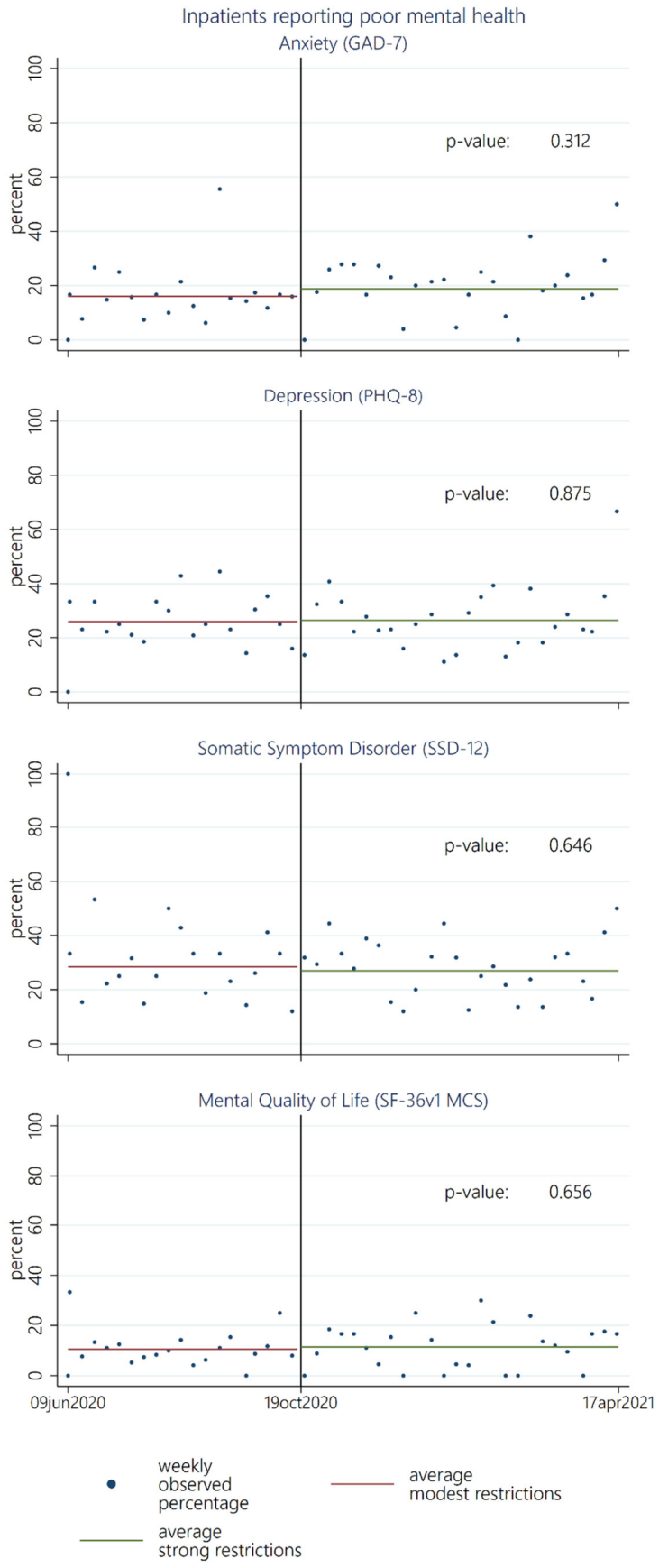
Inpatients reporting poor mental health
Anxiety (GAD-7)
p-value: 0.312
Depression (PHQ-8)
p-value: 0.875
Somatic Symptom Disorder (SSD-12)
p-value: 0.646
Mental Quality of Life (SF-36v1 MCS)
p-value: 0.656
percent
0
20
40
60
80
100
09jun2020
19oct2020
17apr2021
weekly observed percentage
average modest restrictions
average strong restrictions

Figure 6.3 Comparison of percentage of hospital inpatients' mental health according to respective mental health assessment tools during the pre-period of modest and the post-period of strong coronavirus disease 2019 (COVID-19) restrictions (N = 873). P-values are based on unadjusted linear regression analyses.
GAD-7 = 7-item General Anxiety Disorder questionnaire
PHQ-8 = 8-item Patient Health Questionnaire
SSD-12 = 12-item Somatic Symptom Disorder questionnaire
SF-36v1 = Short Form 36, version 1
MCS = mental component summary

Table 6.4 Change in percentage of hospital inpatients with poor mental health according to the mental health assessment tools from periods of modest to strong coronavirus disease 2019 (COVID-19) restrictions, based on linear regression models (*N* = 873)

	Change in percentage of distressed hospital inpatients (95%-CI)
Anxiety (GAD-7)	1.68 (-5.10 to 8.45)
Depression (PHQ-8)	-1.43 (-9.23 to 6.37)
Somatic Symptom Disorder (SSD-12)	-5.55 (-13.34 to 2.25)
Mental Quality of Life (SF-36v1 MCS)	1.81 (-3.82 to 7.43)

Results are adjusted for sex, age group, nationality, education level, marital status, weekly incidence of COVID-19 infections in Basel-Stadt, and hospital.

CI = Confidence Interval
GAD-7 = 7-item General Anxiety Disorder questionnaire
PHQ-8 = 8-item Patient Health Questionnaire
SF-36v1 = Short Form 36, version 1
MCS = mental component summary

Discussion

To the best of our knowledge, there are no data on the impact of COVID-19 restrictions on general hospital inpatients not admitted for COVID-19. In this study, we investigated the association between the intensity of COVID-19 restrictions with levels of COVID-19-

related distress, mental health, and perceived social support among inpatients not admitted for COVID-19 in Swiss general hospitals. Our main findings were that general hospital inpatients not admitted for COVID-19 reported higher COVID-19-related distress in some life areas in the period of stronger COVID-19 restrictions compared to the pre-period of modest COVID-19 restrictions: The percentage of hospital inpatients reporting more COVID-19-related distress regarding leisure activities and loneliness increased by 13% and 9%, respectively, when stronger COVID-19 restrictions were in place. However, this did not go along with indications of worse mental health regarding anxiety (GAD-7), depressive symptoms (PHQ-8), psychological distress associated with somatic symptoms (SSD-12), and mental quality of life (SF-36v1 MCS). Also, there was no indication for changes in perceived social support coinciding with stronger COVID-19 restrictions.

Our findings are in line with other studies that observed distress but no mental health consequences of strong COVID-19 restrictions in populations with selected somatic diseases. Yet, in contrast to our study, these studies did not include hospital inpatients not admitted for COVID-19. A study of young adults with congenital heart disease reported that COVID-19 restrictions were associated with loneliness and concerns about the respondents' health but not with depression or anxiety symptoms (Wehrle et al., 2020). This is mirrored in our results where, after the substantial new restrictions on leisure activities and social interactions imposed by the Swiss government from October 2020 onwards, more general hospital inpatients not admitted for COVID-19 stated distress regarding loneliness, independent of sex and age group. Despite this fact, the social support of general hospital inpatients not admitted for COVID-19 did not change with strong COVID-19 restrictions. Similarly, studies in Greece and in the Netherlands observed high levels of distress but no symptoms of depression or anxiety, or changes in mental quality of life in patients with chronic disease and dialysis patients, respectively (Louvardi et al., 2020, Bonenkamp et al., 2021). Also in line with present findings is a German study investigating a cohort of patients with pre-existing mental disorders reporting an increase of psychosocial burden in patients in April/May 2020 before normalizing to pre-pandemic

levels in November/December 2020 (Bartels et al., 2021). At the same time, symptoms of mental disorders only changed minimally (Bartels et al., 2021).

The literature highlights a substantial mental health burden of the pandemic. Thereby, Chiesa et al. described a positive association between COVID-19 restrictions and depression or anxiety in the general population (Chiesa et al., 2021), although no evidence for long-term effects of COVID-19 on mental health was found (Wallbridge Bourmistrova et al., 2022). However, evidence on COVID-19 restrictions and their impact on individuals with chronic diseases is scarce. Studies in Brazil that did not include hospital inpatients not admitted for COVID-19 suggest that people with chronic diseases had a higher likelihood of aggravated depression and anxiety symptoms than people without chronic diseases during the first wave of the COVID-19 pandemic compared to before the pandemic (Feter et al., 2021).

Several reasons may explain why we did not find indications of an association between strong COVID-19 restrictions and mental health in general hospital inpatients not admitted for COVID-19. First, most of the specific measures during the period with stronger COVID-19 restrictions did not directly affect patients who were hospitalized. Second, during their stay at a general hospital, the included hospital inpatients presumably were primarily focused on their physical well-being and health, while COVID-19 and its restrictions may have temporarily faded into the background. This may have positively influenced patients' self-reported mental health. Third, hospital inpatients may have developed coping strategies, such as seeking emotional support or avoiding the stressor (e.g. reducing the consumption of COVID-19 news), which reduce negative impacts of distress on mental health (Schneiderman et al., 2005, Fluharty and Fancourt, 2021). Fourth, individual and societal resilience may have prevented an increase of mental health consequences resulting from strong restrictions, as already described by others (Prati and Mancini, 2021, Vinkers et al., 2020). Fifth, over time, the population may have adapted to the COVID-19 restrictions. Various studies observed a decrease in depressive symptoms and anxiety after an initial rise at the beginning of the COVID-19 pandemic (Bräscher et al., 2021, Fancourt et al., 2021, Richter et al., 2021).

Strengths and limitations

Our study has several strengths. First, the focus on general hospital inpatients not admitted for COVID-19 with different somatic complaints provides a relevant addition to the current knowledge because chronic illness is a risk factor for distress (Xiong et al., 2020). Second, this study applied data collection over time as well as comprehensive measures on COVID-19-related distress, mental health, and social support. Third, this study included data covering a period in 2020 with modest COVID-19 restrictions and the second/third wave of the COVID-19 pandemic with stronger restrictions in Switzerland. Many other studies still refer to mental health during the first wave in 2020, which may be different from the effects of COVID-19 restrictions after multiple lockdowns (Prati and Mancini, 2021). As a result, our work can contribute to the understanding of the effect of different levels of COVID-19 restrictions on mental health after exposure to the COVID-19 pandemic becoming routine.

Some limitations should be mentioned. First, the data do not include individual follow-up data. This would have allowed estimating changes in mental health within individual hospital inpatients between periods of modest and strong COVID-19 restrictions. Through the nature of our data, however, we were able to assess trends of COVID-19-related distress and mental health before and after a switch from modest to strong restrictions. Second, mental health consequences were assessed using self-reported data. Self-reporting tools, however, often overestimate mental health consequences compared to clinical interviews (Thombs et al., 2018). As we were interested in the change of mental health from modest to strong COVID-19 restrictions, the used mental health assessment tools were sufficient. Third, our results cannot be transferred to the general population or to all hospital inpatients due to the restricted range of wards in which patients were recruited. Therefore, generalizability of results beyond patient groups from the specialties covered should be conducted with caution. Forth, observational data are prone to confounding. To account for this, we adjusted the statistical analysis for these factors. Fifth, smaller effects are of course possible, but could not be detected with the sample size we had. It is also possible that anxiety and depression do not respond immediately

to short-term variations in external disease risk or government measures. Long-term follow-up studies would be required to answer this empirically. Sixth, it is possible that the differences in exposures were too small to see differential mental health outcomes. All measures were taken during the pandemic, just at different stages

Policy implications and future research

The increased distress regarding leisure time and loneliness during strong COVID-19 restrictions indicates that promotion of alternative social interactions (e.g. virtual) and outdoor activities (e.g. walking) may be of great value to diminish distress levels. However, social support did not change with stronger COVID-19 restrictions in hospital inpatients not admitted for COVID-19. The present social support may have strengthened the individual resilience, and hence, alleviated detrimental mental health consequences in this vulnerable population. Future research should focus on pathways explaining why COVID-19-related distress does not result in mental health consequences. Specific aspects of interest are the individual and societal resilience in the context of changing COVID-19 restrictions, as well as potential temporal delays of mental health consequences. Qualitative research may add value to these aspects and may help to explain our results.

Conclusion

Our results indicate that the pronounced tightening of COVID-19 restrictions in Switzerland, in the period October 2020 to April 2021, went along with higher COVID-19-related distress among general hospital inpatients not admitted for COVID-19 in Switzerland but did not associate with measurable changes in overall mental health. More specifically, hospital inpatients not admitted for COVID-19 felt more distressed regarding restrictions in leisure time and loneliness during times of strong COVID-19 restrictions. Therefore, social interactions (e.g. virtual) should be promoted to mitigate distress levels.

More research is needed to understand the differing results regarding COVID-19-related distress and mental health.

SomPsyNet CONSORTIUM

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CHAPTER 7

Can Big Data be used to monitor the mental health consequences of COVID-19?

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CAN BIG DATA BE USED TO MONITOR THE MENTAL HEALTH CONSEQUENCES OF COVID-19?

Introduction

The COVID-19 pandemic has profound mental health consequences (The Lancet Infectious, 2020). Yet, opportunities to monitor and mitigate mental health problems in this context remain scarce (Taquet et al., 2021). At the same time, nearly half of the world's population (49%) now use social media and digital tools such as natural language processing have improved considerably, particularly for mental health (Shatte et al., 2019). Using these tools, researchers have identified and monitored signs of mental illness reflected in social media data including stress, loneliness, depression, or post-traumatic stress (Shaughnessy et al., 2018). Such approaches, part of a growing field called digital epidemiology, could help identify populations in need of mental health support during the current pandemic. More specifically, sentiment analysis of content posted on popular social media platforms, combined with detection of spatiotemporal disease incidence changes could provide decision makers and public health experts with critical information to supplement traditional epidemiological data sources, and to inform the implementation of targeted mental health interventions (Gruebner et al., 2017, Gruebner et al., 2016, Naslund et al., 2019).

Ethical and legal concerns of Big Data

Despite the promise of Big Data, it is important to acknowledge that these digital epidemiologic approaches also raise ethical and legal concerns, particularly with regards to consent, privacy expectations, data protection, and security. Social media users posting publicly may not have consented to being in a research study, and those suffering from mental illness may not have intended for their posts to reveal their health status. People

may have shared their information via social media while in a temporary vulnerable state of mind, e.g., during a crisis or during a disease outbreak. In this case, they may not necessarily realize that what they share can potentially be collected and analyzed by third parties, either for relief, marketing, or scientific activities. Yet being identified as mentally ill might cause stigma in private life, at work, become a source of discrimination, and might affect access and use of healthcare services. These ethical issues are compounded by potential legal issues, including regulations regarding the security and protection of the data, and the malicious use of sensitive, health-related data by third parties. Therefore, methodologies, such as de-identification and anonymization, can ensure data protection and privacy by removing personal identifiers. Geo-masking or aggregation of spatial data are also applied to remove geographical attributes (Swanlund et al., 2020).

Methodological concerns of Big Data

Research or interventions based on Big Data are subject to validity concerns. The theory underlying formal statistics typically assumes random sampling (Mooney and Garber, 2019), but because e.g., social media users may not be representative of the general population in terms of demographics or socioeconomic factors, analyzing these data without accounting for the potential non-representativeness may result in selection bias and low internal and external validity (Mooney and Pejaver, 2018). Furthermore, when Big Data are missing key covariates, it may be difficult to account for the effect of confounding factors (sex, socioeconomic determinants, ethnicity). An additional important challenge concerns the assessment of the mental health outcome itself. While the development of advanced sentiment analysis function as a proxy for highlighting emotional distress in the digital sphere, this type of approach precludes any formal assessment of actual mental health outcomes and may result in distorted conclusions. Big Data is also prone to p-hacking (manipulation of data to achieve statistical significance) and harking (hypothesizing after the results are known), especially if the data contains many variables. Hence, a pre-registered analysis plan adds credibility. This plan should

include an adjusted significance level, because very small effects may become significant by chance when working with Big Data. Finally, claims of causality cannot be made; therefore, data have to be interpreted carefully. Overall, the strict adherence to reporting guidelines is of utmost importance to overcome methodological concerns.

Strengths of Big Data

Despite these concerns, Big Data analysis may contribute to a more comprehensive understanding of the mental health consequences from the current COVID-19 crisis. Big Data are not only "long" (covering many individuals), they are also "large", that is, they contain many variables that are already included or that can be easily extracted from these data (Gruebner et al., 2017). The main strength of this approach however is the huge data volume made available even across national borders and health care systems. Thereby, dozens of millions of e.g., geo-referenced Twitter tweets, may be analyzed, substantially increasing the statistical power of spatial analyses linking mental health determinants, COVID-19 case counts or regulations, and sentiments of social media users in those locations (Mooney and Pejaver, 2018). Therefore, Big Data analyses could help identify regional differences and establish correlations with other factors such as incidence rates of COVID-19, lockdown strictness or other policies aimed at containing the pandemic, or hospital overcrowding. Analysis of big social media data in combination with spatial epidemiological approaches may further identify geographic hotspots of increased symptoms of mental health problems over time (Gruebner et al., 2016). This in turn could provide key operational information to help implement appropriate mental health support and prevention measures. Moreover, real time monitoring of the mental health consequences of COVID-19 may help set up governments to respond rapidly and appropriately to changes in mental health status. Unlike formal epidemiological studies, the huge data volume and wide geographic coverage of Big Data surveillance come at limited costs and in real-time, making this approach an efficient use of resources. The main limitations are computational power, interpretability, and threats to generalizability.

Conclusion

We recommend the use of Big Data approaches to monitor mental health in the general population, especially in the context of heightened anxieties and threats to mental wellbeing owing to the COVID-19 pandemic, as there may be ways to leverage these novel data sources to help deliver targeted support to specific populations including those who are most susceptible to the impacts of the pandemic and resulting mental health consequences. Hence, Big Data hold potential to strengthen our mental health prevention systems in the context of a global public health crisis. There will be ethical and technical challenges, which will require careful and continued efforts to overcome, but these digital approaches can support multifaceted strategies including both modern technologies and traditional approaches.

CHAPTER 8

Synthesis, discussion, and perspectives

SYNTHESIS, DISCUSSION, AND PERSPECTIVES

Poor mental health affects somatic disease course and the overall healthcare system (Aubert et al., 2019, Beeler et al., 2020, Jansen et al., 2018, Prince et al., 2007). Thus, it is key to improve mental health services for vulnerable populations like general hospital patients. However, there is insufficient evidence on the integration of mental health services into hospital setting with a strong focus on the treatment of somatic diseases. Therefore, we assessed the relevance of mental–somatic multimorbidities and possible integration of mental health services into these settings.

SUMMARY OF THE MAIN RESULTS

To improve the early detection of poor mental health in hospital settings, routine screenings is needed. However, before being able to implement a SCCM including a psychosocial distress assessment and appropriate treatment, it is fundamental to know the context. Physicians and nurses perceived mental–somatic multimorbidities in a general hospital setting to be relevant, also due to the perceived high frequency of mental–somatic multimorbidities. Despite this fact, healthcare professionals rated the priority of mental health dimensions to be low, especially physicians (CHAPTER 4). Interviewed junior physicians mentioned that they make referrals to mental health specialists but do not communicate this with colleagues. Nurses described that a suboptimal environment in hospitals hinders talking to patients about sensitive topics like their mental health in privacy. Further, suboptimal interprofessional collaboration between nurses and physicians, or physicians and mental health specialists impeded the integration of mental health detection and treatment into general hospital processes focusing on somatic diseases. This was aggravated with existing stigma among some healthcare professionals and patients related to mental conditions, lack of mental health knowledge, and the strong emphasis on somatic diseases in this time-constraint setting.

Given the challenges of healthcare providers voluntarily integrating mental health in a general hospital setting, we assessed facilitators and barriers of implementing a routine psychosocial distress assessment as part of a SCCM (CHAPTER 5). The use of preexisting hospital processes and IT systems and being able to adapt the assessment to the different wards facilitated the implementation of the psychosocial distress assessment. However, healthcare professionals asked for a more objective assessment than one based on "gut feeling". Additionally, lack of awareness and familiarity with the psychosocial distress assessment, probably related to the high turnover rates of physicians, may hinder successful implementation of the assessment. General hospitals further are characterized by a high workload while time is scarce. Having a focus on somatic diseases, mental health's priority is low.

During the COVID-19 pandemic, mental health in the general population and in vulnerable populations like general hospital inpatients became a key concern. In particular, a greater proportion of this vulnerable population of general hospital patients who were not admitted to hospital due to COVID-19 felt COVID-19-related distress related to leisure time and loneliness during periods with strong COVID-19 restrictions (CHAPTER 6). Although the social contacts and many leisure time activities were restricted or even prohibited, the COVID-19-related distress did not go along with changes in social support or mental health consequences, such as depressive and anxiety symptoms, psychological distress associated with somatic symptoms, and mental quality of life. Hence, distress does not always immediately result in mental health consequences.

When changes in large populations occur due to, for instance, policy changes, new service models, or natural causes like the COVID-19 pandemic, Big Data are of interest for research (CHAPTER 7). Big Data like social media or routinely collected hospital data can support monitoring of mental health of various population groups to tailor appropriate interventions. Ethical and legal concerns regarding data protection and methodological concerns regarding manipulating the data have to be kept in mind and be counteracted through transparent research.

GENERAL DISCUSSION

This thesis contributes to the evidence through adding evidence on new populations (non-COVID-19 hospital patients), new focal areas (mental–somatic multimorbidities), and new settings (general hospital settings).

Psychosocial distress assessment – who should do it?

Although the interviewed healthcare professionals recognized the need to integrate mental health services into the hospital setting, our qualitative studies highlight the low priority of mental health and its assessment in hospital settings, particularly among physicians (CHAPTER 4 and CHAPTER 5). Different reasons were mentioned by our interviewees: High turnover rate, which may impede continuity of care (Krogstad et al., 2002) and implementation outcomes, such as fidelity and the spread of evidence-based practice (Woltmann et al., 2008), pressure by seniors and colleagues, different duration at bedside, and the historical view present at the hospital setting. This low priority was underpinned by the low rate of patients' psychosocial distress assessments that were filled in by physicians. Not using screenings was one barrier to the implementation of stepped care in primary care (Hermens et al., 2014). But without the screening, the SCCM cannot detect distressed patients and consequently, there is no SCCM. This raises the question whether physicians should assess patients' psychosocial distress?

On the one hand, physicians are the decision makers regarding patients' mental health in most specialties while nurses still act as "auxiliary staff" (House and Havens, 2017, Tan et al., 2017). Physicians need to actively trigger a consultation with a mental health specialist when it is necessary. Nurses, who spend more time at bedside and get to know the patient in different situations, are not able to trigger these consultations directly and need to convince the physician about the poor mental health of the patient (CHAPTER 4). Thus, interprofessional collaboration is key to routine psychosocial distress assessment. However, interprofessional collaboration was described as a major challenge in the general hospital settings (CHAPTER 4). This may be related to different perceptions of

physicians' and nurses' role – hierarchy is still present (House and Havens, 2017, Tang et al., 2013). However, interprofessional collaboration is an essential part of integrated care (Valentijn et al., 2013). Particularly, due to the current structures on some wards where only one profession is able to involve the CL service in case of mental health needs.

On the other hand, the strong focus on somatic diseases during physicians' education and work impedes the integration of mental health topics. Nurses' education, however, stresses interpersonal skills (Hughes and Fitzpatrick, 2010), fostering the recognition of mental–somatic multimorbidities. This implies a stronger integration of nurses than physicians to routinely assess patients' psychosocial distress. Physicians need to decide on a somatic or psychiatric focus already during their education. When deciding to focus on somatic diseases, the physicians have several rotations depending on their specialty (Schweizerisches Institut für ärztliche Weiter- und Fortbildung, 2022). Within these rotations, it is not compulsory to spend time in a psychiatric setting (Schweizerisches Institut für ärztliche Weiter- und Fortbildung, 2022). Thus, their experience is often limited to somatic diseases without including mental health. When starting to work at the hospital, junior physicians are then confronted with senior physicians and colleagues with a strong interest in somatic diseases and limited interest or possibility to integrate mental health into their daily clinical work (CHAPTER 4 and CHAPTER 5). Although personal interest was seen to facilitate quality of care (Supper et al., 2015), mental health is often seen as not being their responsibility (Foye et al., 2020). Current clinical work is disease-focused, offering tools to assess risks and signs of a specific disease, instead of a person-focused organization (Valentijn et al., 2013). This strong somatic focus is to the detriment of holistic care (Sharrock and Happell, 2006) (CHAPTER 4 and CHAPTER 5). Hence, physicians' practice is affected by reducing cultural, social, and psychological aspects of a patient. They mainly assess somatic signs, symptoms, and measurements. As one physician stated, it is easier to do blood tests than to talk to the patients about the patient's psychological well-being (CHAPTER 4). Still, this highly depends on the specialty the physicians are working in. Interviewed gynecologists, for instance, emphasized the

importance of mental health in general for their patients and how they routinely try to integrate it into their daily clinical routines (CHAPTER 5).

In future, three approaches may enhance adherence to the psychosocial distress assessment as the starting point of the SCCM: either nurses receive the possibility to trigger consultations with mental health specialists, or the interprofessional collaboration between nurses and physicians is strengthened so that suggestions of nurses are taken into account by all physicians, or coordinating professions should be employed. First, thinking about the routine psychosocial distress assessment, a threshold based on the data collected by SomPsyNet could be defined, for which mental health consultations are triggered automatically. This would allow for nurses to indirectly trigger the CL service. The second approach aiming at improvement of interprofessional collaboration should include interprofessional trainings, workshops, and/or meetings. These could enhance understanding for each other's perspective and thus, strengthen interprofessional collaboration. Also, informal exchanges were seen to be relevant when communicating patient issues to physicians (Burm et al., 2019). However, nurses and physicians seem to perceive their collaboration differently (House and Havens, 2017, Tang et al., 2013). Although this cannot be generalized to all physicians, nurses mentioned issues with respecting their opinion. This should be considered in interventions and implementation of new service models. Defining and raising awareness about the roles and competencies of each profession was seen to be essential in primary care (Supper et al., 2015) and should be taken over to hospital care. Lastly, most stepped care models employed case managers to coordinate healthcare (Maehder et al., 2019). Nurses could also take over this role. Historically, nurses' work was holistic, before it changed in the 1900's (Thornton, 2019). This now becomes different again: The role is seen to be more holistic, particularly to coordinate healthcare when multiple professionals/specialties are involved (Thornton, 2019). Advanced Practice Nurses (APNs) would be one example to support psychosocial distress assessments and organizing appropriate treatment, and monitoring of patients' psychosocial distress. Strengthening the collaboration between hospitals and family practitioners is another possibility to allow monitoring beyond the hospital stay. On the

one hand, family practitioners know their patients and can inform attending physicians at the hospitals about the patients. On the other hand, they have often regular contact to the patient, guaranteeing the continuity of care.

Continuity of care in the hospital setting

Hospital settings are characterized by patients in need for acute and specialized care. The work presented here suggests that early detection of distress during hospital admission is possible (CHAPTER 6). Previous studies focusing on the integration of SCCMs in primary care highlighted the benefits of having several specialties in one place in terms of improved collaboration (Maehder et al., 2021, Overbeck et al., 2016). Co-location of different specialties is a part of integrated healthcare (Heath et al., 2013). This co-location allows, for instance, having interdisciplinary meetings with all relevant healthcare professionals (e.g., physicians, nurses, psychiatrists, physiotherapists, case managers, and others) to provide holistic care (CHAPTER 4 and CHAPTER 5). Hospitals offer this co-location. Thus, hospitals seem to be ideal to implement SCCMs including routine psychosocial distress assessments.

At the same time, today's hospital culture is characterized by specializations, which leads to working in silos (Plochg et al., 2009, Wood et al., 2017). This, in turn, is hindering the implementation of collaborative care (Wood et al., 2017). Still, this setting is dominated by the biomedical model where cultural, social, and psychological factors are not addressed and collaboration of the different specialties including these aspects is neglected (Bramesfeld et al., 2012, Wade and Halligan, 2017). Not only within the hospital but also follow-up services that are needed to optimally treat a patient remains challenging. The SCCM presents, thus, an opportunity to implement a holistic approach to address mental–somatic multimorbidities in hospitals. Nevertheless, the hospital itself is not able to guarantee continuity of care after the hospital stay. A more person-centered approach with long-term relationships between the patient and the responsible healthcare professional and sharing of knowledge and information on the patient across

the different healthcare professionals within and outside the hospital is essential to ensure continuity of care (Ljungholm et al., 2022). Few specialties, for instance geriatrics, are aware of including various perspectives including social and psychological factors (Plochg et al., 2009). The overall trend of specialization, however, is not in line with the growing challenge of multimorbidity including mental–somatic multimorbidities. Thus, a more integrated view and close collaboration between different healthcare professionals, including for instance family practitioners, and the patient, like the SCCM presented here, is needed to be able to treat them in a holistic manner and offer continuity of care.

Continuity of care through long-term relationships and information-sharing across specialties and organizations further allows to monitor patients' mental health, which is needed to ensure appropriate and evidence-based treatment (Egholm et al., 2022). Outside hospitals, this can be offered by family practitioners, but in hospital settings, most patients are admitted in acute situations and do not regularly see the same physician. Some patients, however, have routine visits like cancer or transplantation patients who may be more appropriate to target for psychosocial distress assessments within the hospital setting than others due to the possibility to have repeated assessments. Particularly cancer patients already have a routine screening for psychosocial distress (Ownby, 2019). Limiting the routine psychosocial distress assessments to specific patient groups might be a possibility to improve early detection of psychosocial distress in hospital settings without putting more stress to healthcare providers through the necessity to assess patients' psychosocial distress during a short hospital stay. Psychosocial distress assessment of patients who have routine visits further enables monitoring, which is an important aspect of SCCMs.

Time constraints at the hospital setting

We observed several challenges to integrate mental health, and particularly a SCCM, into hospitals (CHAPTER 4 and CHAPTER 5). Time is a scarce resource in hospital settings. This is a major challenge when implementing interventions into this setting (Sorensen et al.,

2016). Although, for instance, interdisciplinary meetings are desirable on each ward, time constraints make it impossible to implement these meetings on each ward. Nurses and physicians further mentioned that patients with mental–somatic multimorbidities need more effort and time. They are not able to efficiently use the hospital stay to assess and treat mental–somatic multimorbidities, also due to insufficient environment hindering private exchanges about sensitive topics like psychosocial well-being (CHAPTER 4). This was confirmed by patients in the UK who additionally reported experiences of negative stereotypes (e.g., being untrustworthy or manipulative) although they just would like to be treated with respect, including psychosocial aspects (Sharda et al., 2021, Mickelson Weldingh and Kirkevold, 2022). This needs trust, which again needs time to build up. Additionally, it might not be clear whether a certain behavior of patients is related to their character (e.g., introvert patients) or if this is a sign for psychosocial distress (CHAPTER 5). Length of hospitalization is, thus, a key factor affecting recognition and treatment of psychosocial distress in hospital settings. While some specialties like orthopedic or surgery patients have shorter hospital stays, patients on internal medicine may need more time to, for instance, adjust their medication, which may help to better detect psychosocial distress in internal medicine patients.

Awareness of psychosocial distress assessment – a challenging task

The awareness of psychosocial distress assessment was low among healthcare professionals, among physicians in particular (CHAPTER 5). This was emphasized although healthcare professionals were aware of the need for integration of mental health dimension into hospitals (CHAPTER 4). One major reason mentioned was the high turnover rate of physicians, especially at the University Hospital Basel. In some specialties, junior physicians have to rotate every two to four weeks and work on another hospital ward to get a broader view on the medical specialty. Thus, when joining a ward where the psychosocial distress assessment is implemented, the physicians have to be

specifically informed. Thus, organizational support is key to increase the awareness and sustainability of implementing collaborative care (Blasinsky et al., 2006).

There are several ways to optimize the awareness of the mental health and its assessment. Healthcare professionals newly starting a position on a respective ward have to attend an online training about the psychosocial distress assessment. It is necessary that seniors inform the new employees about this. However, it has to be kept in mind that there are many other trainings they have to complete. A psychosocial distress assessment without having direct consequences on the hospital stay still may be perceived to be irrelevant at the hospital. On the one hand, time constraints reduce the adherence to guidelines (Smolders et al., 2010), such as the psychosocial distress assessment. On the other hand, motivation and interest was described to play an essential role when integrating mental health into primary care (Wakida et al., 2018). Indeed, this may not be different for general hospitals. The relevance of mental–somatic multimorbidities was highlighted (CHAPTER 4) and should be used as an entry point to stress the implementation of psychosocial distress assessment. But already the assessment itself raises the awareness of mental health (Egholm et al., 2022), including psychosocial distress.

Another possibility to raise awareness on the psychosocial distress assessment is to set up monitoring and feedback. Either a senior physician or a leading nurse could take over the role to report back to nurses and physicians if the psychosocial distress assessment has to be done. This could also be integrated into the IT system by having automatic reminders. If the psychosocial distress assessment is missing and physicians or nurses open the electronic patient file, a reminder could pop up, informing them about the necessity to report the patient's psychosocial distress. Through this, the priority of the assessment may increase.

Next, awareness could be raised through advertisements and events. Research showed that having new guidelines is not enough to change behaviors, but programs to encourage implementation are needed (Egholm et al., 2022). The Day of Psychosocial Health in Basel-Stadt implemented by the SomPsyNet project was one step to increase

visibility of psychosocial distress and its assessment to improve patients' quality of life (Gesundheitsdepartement Basel-Stadt, Gesundheitsdepartement Basel-Stadt). Also, the hospital itself has to raise awareness. Advertisements at the hospital may not only raise the healthcare professionals' awareness, but also increase the interest of patients to be treated in a holistic way. This is particularly important because it was seen that patients do not recognize the need for treatment, leading to undertreatment (Alonso et al., 2018, Thornicroft et al., 2017). By raising patients' awareness on the importance of assessing psychosocial distress, they may stress this to their physicians, and in turn, physicians may be motivated to integrate mental health into their daily routines to stick to the patient demands. This is also relevant, because healthcare professionals mentioned that sometimes they are more afraid to talk to the patients about sensitive topics such as mental health, but actually patients are willing to be seen in a holistic manner (CHAPTER 4).

Most important is, however, that junior physicians and nurses assessing the patient's psychosocial distress are involved in the development and continuation/improvement of a routine psychosocial distress assessment. The SomPsyNet project involved senior physicians and nursing department managers in the development of the SCCM. However, assessment executors were not directly involved. This top down approach is linked to a lack of awareness and understanding of potential SCCM's benefits for the daily work within the hospital setting. Being able to support the development and integration of a psychosocial distress assessment and to adapt the assessment to the specific patient needs and processes on the specific ward may increase the awareness of and adherence to the psychosocial distress assessment. Thus, sustainability of the assessment could be increased.

The Stepped and Collaborative Care Model as a whole – chances and challenges

Spiess and Ruflin (2018) presented several models of good practice on coordinated care at the interface of mental and somatic health focusing on patients with mental–somatic

multimorbidities. They introduce eight models dealing with screenings, coordination of transfer from somatic to mental health care, close collaboration between somatic and mental health care professionals (including regular exchanges and CL services), and training of health care professionals. Key components were found that contribute to the success of these models. The SCCM presented in this thesis displays some of these key components of a model of good practice at the interface of mental and somatic health. However, some important challenges could be observed during the implementation.

Table 8.1 Chances and challenges of the implementation of a Stepped and Collaborative Care Model in Switzerland

Chances	Challenges
Standardization	Motivation of healthcare professionals
Efficient communication channels	Transferability
Sensitization, reducing stigma	Existing stigma
Effectiveness study and evaluation	Slow treatment success
Infrastructure available	Human resources
Key stakeholders involved	Not all hierarchies involved
Adaptability	Working in silos
Fostering knowledge, competencies	
Holistic approach	

The SCCM presents several chances to be a model of good practice (Table 8.1). The screening and the treatment offered to patients with mental–somatic multimorbidities are standardized. This standardized approach lowers the risk of missing cases (Spiess and Ruflin, 2018). Having a standardized approach also allows to shorten communication channels. For instance, the CL service can be automatically involved if the psychosocial distress assessment reaches a certain threshold. In some hospitals implementing the SCCM, the project team is already directly informing the CL service about possibly

distressed patients, while in other hospitals, the CL service still has to be actively triggered by the attending physician. This showcases the adaptability of the model. The SCCM can be adapted to the needs of the hospitals and hospital wards (CHAPTER 5). Further, an online training is available to explain what psychosocial distress is, why it is important in the hospital setting, and how the SCCM tries to support patients with these mental–somatic multimorbidities. Healthcare professionals' knowledge and competencies can, thus, be strengthened. However, some interviewees never heard about this possibility or knew about it or they did not use this online training because they have to do many other, for them more relevant, online trainings (CHAPTER 5). Our interviewees also mentioned that the assessment alone sensitized them for mental–somatic multimorbidities (CHAPTER 5). Healthcare professionals were already aware of the relevance of mental–somatic multimorbidities in the hospital setting (CHAPTER 4). However, the strong focus on somatic diseases in this setting, hindered them from actively integrating mental health aspects into their routine (CHAPTER 4 and CHAPTER 5). The routine of integrating mental health in this somatic setting may also reduce the stigma of healthcare professionals and patients. An effectiveness study and an external evaluation going on will give more insights into possible benefits of the SCCM. The SomPsyNet project team themselves also regularly reviewed the processes and adapted them if necessary. For instance, additional trainings and reminders were tested to increase the response rate of physicians. This openness to changing the SCCM is important to allow the model to work in practice and improve outcomes of the SCCM. One of the expected outcomes is that the healthcare costs will be reduced long-term after an increase short-term. Human resources but also increased numbers of consultations with mental health specialists will probably first increase the healthcare costs. Afterwards, the anticipated reduced number of rehospitalizations and shorter hospital stays are expected to reduce the overall healthcare costs. Additional resources are limited because the SCCM uses the already present infrastructure. One resource that was built during the project was an online platform displaying mental health specialists and other support available for patients with mental–somatic multimorbidities (Gesundheitsdepartement Basel-Stadt, 2021). This online platform should help patients and healthcare professionals to find the support needed

and thus, facilitate the access and strengthen the collaboration between services within and outside hospitals (Aebi, 2021). Last but not least, key stakeholders from clinical and political settings were involved in the development and operation of the SCCM. The Health Department Basel-Stadt developed this model together with a team of the Psychosomatic Medicine at the University Hospital Basel. An entire consortium with family practitioners, psychiatrist, disability insurance, and more was involved in this project, supporting its implementation. All these factors mentioned provide a holistic approach and are essential for the sustainability of the SCCM.

Some challenges have to be mentioned as well. Interviewees emphasized the missing motivation (CHAPTER 5). Generally, reluctance to change routines/process in healthcare was described as a major barrier for integrated care models (World Health Organization, 2016). In our studies, healthcare professionals highlighted the relevance of mental health dimensions in the hospital setting (CHAPTER 4). However, the slow success of such mental health interventions may impede the motivation to integrate mental health dimensions into this setting. It is not possible to improve the patients' mental health during one hospital stay, so that healthcare professionals are able to observe direct treatment success. Also, stigma is present in healthcare professionals and patients, impeding the integration of mental health in this somatic setting (CHAPTER 4 and CHAPTER 5). The support by leaders is, thus, essential. Some senior physicians and leading nurses who were involved in the development of the SCCM offer this support. However, not all seniors are aware of the SCCM and, according to the interviewees, support the integration of mental health dimensions into hospital settings (CHAPTER 5). This is also related to healthcare professionals working in silos. Although the SCCM aimed to improve interprofessional and multidisciplinary collaboration, the medical specialties are still working separately. The screening is done by somatic healthcare professionals, the mental health specialists are informed and take over. However, the collaboration does not go over this stage. Also, the collaboration between physicians and nurses did not change with the implementation of the SCCM. The development of the SCCM did also not include all hierarchies. Junior physicians and nurses who are assessing the patients were not

directly involved when thinking about the processes of the SCCM. Further, it is challenging to define roles. Psychosocial distress includes several aspects like social, cultural, and psychological factors. It has to be clearly defined, e.g., when the CL service and when the social workers are needed to support the patients optimally. Last, the transferability of the SCCM to other hospitals and other cantons in Switzerland is unclear. The adaptability allows transferability to different structures. Depending on the multidisciplinary networks available, the implementation of the SCCM will, however, be facilitated or impeded. Where already structures of close collaboration are in place (e.g., canton Aargau with a network of family practitioners and psychiatrist or a well-established CL service at the Lausanne University Hospital (Spiess and Ruflin, 2018)), the SCCM can be transferred more easily. A remaining challenge will, however, be the collaboration of services within and outside the hospital setting to guarantee continuity of care of patients with mental–somatic multimorbidities.

COVID-19-related distress of hospital patients and the general population

During the first wave, mental health of the Swiss general population was assessed (Diaz Hernandez et al., 2021). This study showed that population groups with high risk of severe COVID-19 course are more likely to have impaired mental health. Hence, populations with chronic diseases, also represented by hospital patients, are particularly vulnerable. Despite this fact, in Switzerland, mental health of the general population (Bühler et al., 2021, Diaz Hernandez et al., 2021), healthcare professionals (Hummel et al., 2021, Spiller et al., 2022, Wozniak et al., 2021), and COVID-19 patients (Domenghino et al., 2022, Vincent et al., 2021) was assessed but not mental health of non-COVID-19 hospital patients.

Healthcare was impeded by the COVID-19 pandemic due to restrictions of not urgent medical treatment during the first wave of the pandemic in Switzerland (Bundesamt für Statistik (BFS), 2021), which could end up in increased distress. Populations with chronic diseases often reported fear of not receiving timely and adequate health care due to

COVID-19 (Altinok et al., 2021, Fisher et al., 2021). This may increase distress due to physical constraints, which was, however, not observed in our population of hospital patients (CHAPTER 6). The concerns are still valid, because US and Swiss studies did see that a great proportion of adults did forgo healthcare during the initial phase of the COVID-19 pandemic (Anderson et al., 2021, Baggio et al., 2021, Moser et al., 2020). Also, cancer screenings in the US decreased during stay at home orders, but could be resumed afterwards (Carroll et al., 2022). In Switzerland, one study found that the overall needs for healthcare did not change, but the provider choice was influenced: the general practitioner remained the most important, but consultations with specialist physicians decreased (Giezendanner et al., 2021).

Our results on COVID-19-related distress in hospital patients are in line with the worries and perspectives of the Swiss general population (CHAPTER 6). Although mental health was not assessed with specific tools, the general population was asked about their overall well-being, which decreased with tightening of the COVID-19 restrictions (Bühler et al., 2021). Between October 2020 and March 2021, the Swiss general population was increasingly worried about the COVID-19 restrictions regarding leisure time and loneliness (Bühler et al., 2021). Additionally, their private environment, especially conflicts in this environment, lead to great worries (Bühler et al., 2021), which was not supported by our data. Despite the worries reported in the general population, the majority agreed with the government that the COVID-19 restrictions are appropriate (Bühler et al., 2021). Acceptance and adherence to these measures were high during the first wave of the COVID-19 pandemic in Switzerland in older Swiss adults (Bearth et al., 2021). However, restrictions regarding closure of restaurants and stores of non-everyday needs were questioned by a great proportion of the general population (Bühler et al., 2021). We did not collect information on individual COVID-19 restrictions and are, thus, unable to specify the restrictions being responsible for our results.

After tightening the COVID-19 restrictions, social contacts outside of the household decreased only slightly and not to the level observed during the first wave of the COVID-19 pandemic (Bühler et al., 2021). This is in accordance with our results showing that social

support did not change (CHAPTER 6). Possibly, people started dealing with COVID-19 restrictions and found ways to not substantially reduce their contacts and social support through alternative ways, e.g. meetings outdoors. Still having social support may have prevented the hospital patients from mental health consequences.

Surprisingly, we did not find any changes in mental health consequences, such as depressive or anxiety symptoms (CHAPTER 6). During prior epidemics like SARS, Ebola, or MERS, poor mental health was observed (Brooks et al., 2020, Cénat et al., 2020a). These mental health consequences were still present around six months after quarantine (Brooks et al., 2020). Also other natural disaster like earthquakes were associated with poor mental health (Cénat et al., 2020b, Esterwood and Saeed, 2020). Natural disasters may occur more often due to climate change. Direct (e.g., extreme weather events) and indirect (e.g., economic losses) consequences of climate change can negatively affect mental health (Palinkas and Wong, 2020). Thus, it is important to monitor mental health and offer appropriate support during disaster like epidemics or other natural disasters, particularly for vulnerable populations such as hospital patients.

The use of Big Data

One way to monitor mental health is Big Data. As soon as the psychosocial distress assessment is scaled up to entire hospitals, the data would comply with the definition of Big Data. These Big Data may support the impact evaluation of SCCMs in hospital settings. As we have seen in CHAPTER 7, Big Data have several advantages and disadvantages, but generally can be used to tailor policies to populations with needs. Having psychosocial distress data of each patient allows a more consolidated analysis on the effects. The general consent already in place, for instance, at the University Hospital of Basel, facilitates the use of these data to assess impacts on rehospitalization and other patient related outcomes. An additional advantage of these Big Data from the hospital setting could be the identification of specifically vulnerable groups within this setting. These data could not only be used to monitor mental health in times of pandemics (CHAPTER 7) or other

natural disasters, but also generally to increase mental health support through specifically tailoring vulnerable subgroups. With the aim to foster technological and digital change stated by Health2030 (Bundesamt für Gesundheit, 2019), Big Data will play an essential role in future research to tackle present health care challenges.

METHODOLOGICAL CONSIDERATIONS

To assess the implementation of a SCCM into a hospital setting, we applied quantitative and qualitative methods. The robustness of our results is discussed in this part of the thesis.

Trustworthiness of qualitative studies

Two studies discussed in this thesis are based on qualitative interviews (CHAPTER 4 and CHAPTER 5). Trustworthiness of the qualitative study findings can be discussed using four criteria proposed by (Lincoln and Guba, 1985): credibility, transferability, dependability, and confirmability. These concepts are equivalent to internal and external validity, reliability, and objectivity (Korstjens and Moser, 2018, Lincoln and Guba, 1985).

Credibility refers to the data representing the truth and can be enhanced using several strategies (Korstjens and Moser, 2018, Lincoln and Guba, 1985). We conducted semi-structured interviews (CHAPTER 4 and CHAPTER 5). While the direction of the interviews is thus determined, interviewees still have the possibility to extensively add valuable information on the determined topics. To ensure the clarity of the questions and inclusion of important aspects that we did not include previously, we pilot tested the interview guide and adapted it accordingly. Further, using triangulation of different healthcare professionals (physicians and nurses) and three hospitals differing in their focuses and structure increased the credibility of our findings. This allows exploring the experiences with mental–somatic multimorbidities and the SCCM more comprehensively, which enhances the robustness of the research (Varpio et al., 2017). Member-checking where

interviewees either get feedback on the interview transcripts or the results would further increase credibility. Time constraints of healthcare professionals were already observed during recruitment. Thus, we decided not to do member checking with the interviewees. However, co-authors of the manuscripts working in the hospital setting were able to give feedback on the results from a clinical perspective.

Through thick descriptions, the transferability to other contexts and settings can be assessed (Korstjens and Moser, 2018, Lincoln and Guba, 1985). Using the COREQ-32 reporting guideline and including descriptions on the different hospitals and the context of the interviews allows other researchers to explore the transferability of our findings to their context. We conducted the studies in two public and one private hospital in Basel-Stadt. Our findings might, thus, be transferable to other public general hospitals with similar structures in Switzerland, especially in the German-speaking part. However, especially private hospitals might differ in their mission and focus, limiting the transferability.

Dependability and confirmability were respected using the framework method by Gale et al. (2013). The framework method results in a data matrix consisting of summaries including verbatim quotes, which supports the interpretation of the data. Quotes were also reported within the manuscripts to underline our results. Although the analysis was done by one researcher, others with a different background (clinicians) gave feedback on the results, enhancing the confirmability of our research. Dependability and confirmability can further be enhanced through audits (Lincoln and Guba, 1985). Although raw data, data on the analysis (data matrix) and the interpretation, and reflective notes were available, we did not do an audit through an external auditor.

Evidence on the integration of mental–somatic multimorbidities and the implementation of SCCMs in hospital settings was scarce. Qualitative research methods allowed us to get first insights into this area, without limiting the answers/aspects through closed questions. Thus, qualitative methods were appropriate. However, quantitative studies based on the presented results should be used to reach more healthcare professionals and see whether

a broader range of healthcare professionals faces similar facilitators and barriers to the integration of mental health services.

Parameters for assessment of psychosocial distress – the right choice?

Newson et al. (2020) compared different mental health assessment tools and found great heterogeneity. Triangulation through the use of four different tools was used to increase the robustness of the research results. Still, there are some challenges that have to be kept in mind when interpreting our findings.

Time frames

Mental health indicators used in the quantitative study (CHAPTER 6) refer to different time frames. PHQ-8 and GAD-7 are interested in the situation within the last two weeks, and the SSD-12 does not define a time frame (Kroenke et al., 2009, Löwe et al., 2008, Toussaint et al., 2016). The SF-36 usually asks for the patients well-being during the past four weeks (Ware and Gandek, 1998). To be consistent with the other mental health assessment tools and allow for triangulation, the time frame was adapted to the past week. This reduces the ability to compare the data with other research. Also, patients needed to answer the questionnaire within the first 72 hours after their admission. This is not in line with the time frames of the mental health assessment tools. It is, thus, difficult to differentiate whether answers of patients were focusing on their mental health before hospital admission or during their hospital stay.

Thresholds

Different cut-offs were used to assess mental health depending on the population (e.g., general population vs. populations with chronic diseases), on age or gender (Kroenke et al., 2009, Matcham et al., 2016, Silveira et al., 2005, Smith et al., 2010, Snijkers et al., 2021,

Spitzer et al., 2006, Toussaint et al., 2017, Johnson et al., 2019). The cut-offs used in our study (CHAPTER 6) showed good sensitivity and specificity for SF-36, PHQ-8, and SSD-12 (Matcham et al., 2016, Toussaint et al., 2020, Kroenke et al., 2009, Spitzer et al., 2006). The choice of cut-offs might affect our results on mental health consequences, resulting in a systematic error. Compared to clinical interviews, screening tools, like the ones we used, often overestimate the prevalence of psychosocial distress (Thombs et al., 2018, Levis et al., 2019). However, in epidemiological studies, it is not feasible to assess mental health using resource intensive clinical interviews. The use of self-reported data supports research to gain knowledge on mental health of different populations, its changes due to external events like the COVID-19 pandemic, or the efficacy of mental health interventions. In our case, we were interested in the change with tightening COVID-19 restrictions. Thus, self-reported data was sufficient. Additionally, triangulation through the use of four mental health indicators reduced the probability of systematic errors.

Unvalidated COVID-19-related distress assessment

In 2020, the world faced many challenges through the COVID-19 pandemic. Research on different aspects, including mental health, was done. However, no validated and reliable tools were available to assess mental health impacts that occur specifically due to the pandemic. To be able to compare the study results with other populations in Switzerland (e.g., the general population), the SomPsyNet project team decided to adapt a tool that was routinely used by the Sotomo Institute. However, the transferability of these results to other countries is reduced and it is challenging to compare the results to other countries.

Stepped-wedge randomized controlled trial

The COVID-19 study presented in this thesis is based on data collected within a stepped-wedge randomized controlled trial. Stepped-wedge randomized controlled trials are

often used in evaluation of complex interventions like service delivery interventions, particularly in learning healthcare organization (Hemming et al., 2015). This design allows the evaluation of interventions during routine implementations (Mdege et al., 2011). Hence, this design was adequately chosen for the evaluation and effectiveness study of the SCCM. The intervention is implemented in a random and sequential way until all clusters receive the intervention – an important ethical advantage (Hemming et al., 2015, Mdege et al., 2011).

Nevertheless, stepped-wedge randomized controlled trials face also practical challenges. The SomPsyNet trial was implemented in two steps. The first step from collecting baseline data (Phase 0) to the implementation of the psychosocial distress assessment (Phase 1) took place simultaneously in all clusters (half wards). The second step, however, was done in a random and sequential way. Some half wards were, thus, only executing the psychosocial distress assessment (Phase 1) while others already implemented the entire SCCM (Phase 2). This led to challenges for the study team. Informed consents of patients differed depending on the Phase of the study. The study team, informing patients about all important aspects of the study, had to adapt their explanations and documents accordingly. This increased the workload through additional steps to be sure that the patients are informed for the right Phase of the study and the motivation could be impeded through the complexity.

Thus, when deciding on a stepped-wedge randomized controlled trial, not only methodological advantages and disadvantages have to be kept in mind, but also practical challenges. The execution of the trial should be planned from the beginning with as little resources as possible.

The stepped-wedge randomized controlled trial supports the investigation of new and complex interventions and was thus, suitable for the primary aim of the SomPsyNet study (to evaluate the impact of the SCCM on health-related quality of life). This design allowed the implementation and evaluation of the SCCM at the same time, taking into account time trends and having the SCCM implemented on all participating wards in the end. To

assess associations between mental health and COVID-19 restrictions, a stepped-wedge randomized controlled trial is not necessary. In this study (CHAPTER 6), we were not interested in an intervention that was implemented step by step on different wards, but our "intervention" was the COVID-19 restrictions that were introduced for everybody at the same time.

Secondary data use

Secondary data are reused for another purpose than originally defined (Wickham, 2019). When deciding to collect data on the COVID-19-related distress, no specific research question was defined. Thus, our quantitative study on the association of COVID-19 restrictions and mental health (CHAPTER 6) does not strictly fit the definition of secondary data. Nevertheless, this secondary use of data where a research question evolves post hoc presents several advantages and disadvantages related to secondary data.

The data were easily available, which was a great benefit during the COVID-19 pandemic. In our case, the data collection period started in June 2020, after the first wave of the pandemic. This allowed adding questions specifically targeting psychosocial distress due to the COVID-19 pandemic. Still, the data were not specifically thought to enrich information on the association between COVID-19-related distress and COVID-19 restrictions. Having changes in the COVID-19 restrictions during the data collection period made us think about the impact for vulnerable populations.

Deciding to analyze the data for another purpose brings various disadvantages. First, the questions were related to the COVID-19 pandemic in general and not specifically to its restrictions. Also, the questions do not specifically relate to restrictions at the hospitals. This limits the accuracy of the data. Restrictions within the hospital may have an impact on patients' mental health, which was not the case for the general restrictions being effective at that time (CHAPTER 6). Second, we only used baseline data of the SomPsyNet study, because follow-up data only included distressed hospital patients and the sample size would have been small (N = 135). The approach of looking for time trends in baseline

data is likely not the most suitable one. To assess the impact of different levels of COVID-19 restrictions on hospital inpatients, one would use repeated measures, which would reduce random errors. This means that one would like to survey patients during a period with modest COVID-19 restrictions and repeat the same survey during a period with strong COVID-19 restrictions with the same patients. This would allow observing changes in COVID-19-related distress, mental health, and social support within one patient. This should be taken into account when interpreting the data. Last, if secondary data analysis is performed with a dataset of another research group, data quality is often an issue. However, in our case, data were collected by our research group and therefore, we were able to estimate data quality. Also, several persons were involved in data cleaning.

Keeping the advantages and disadvantages of secondary data use in mind, no trend of mental health consequences with changing levels of COVID-19 restrictions can be observed in the population of hospital inpatients. However, more longitudinal research is needed to strengthen the evidence of strong COVID-19 restrictions having an impact on psychosocial distress and not on mental health.

OUTLOOK AND PERSPECTIVES

Short-term perspectives

Resilience

Resilience is generally seen as an important factor for mental health. Its role during the COVID-19 pandemic, however, is not yet fully clear. As mentioned in CHAPTER 6, resilience could be one reason why we observed COVID-19 related distress, but no mental health deterioration. Within the SomPsyNet follow-up survey, resilience of patients was assessed. The association between the patients' resilience and their mental health during different COVID-19 restriction levels should be part of future analyses.

Other settings

Future research should also focus on other hospitals in Switzerland. We observed that even hospitals in the same canton are organized differently (CHAPTER 4 and CHAPTER 5). The implementation of a SCCM in the French- or Italian-speaking part of Switzerland may encounter different opportunities and challenges. In the French- and Italian-speaking part of Switzerland, integrated care initiatives regarding mental health and psychiatry were more frequent than in the German-speaking part (Schusselé Filliettaz et al., 2018). Thus, the sensitization of mental health topics may be advanced further in the French- and Italian-speaking part, facilitating the implementation of new service models like the SCCM.

Possible implementation perspectives

Roles of different healthcare professionals

Our research showed the different perceptions of roles within the hospital setting with strong hierarchies not only present between different healthcare professionals but also within the same professions (CHAPTER 4 and CHAPTER 5). Clear role definitions within a SCCM are thus important to clarify responsibilities and tasks. The need for role definitions was observed in other studies, particularly for interprofessional collaboration (Supper et al., 2015). Changing certain roles to be able to better integrate mental health into somatic hospital settings can be thought of. For instance, integration of mental health into these settings could be enhanced through employing APNs to coordinate mental health needs of hospital patients, involving social workers routinely as it is done in some settings where patients have longer hospital stays like the Department of Geriatric Medicine FELIX PLATTER, or nurses having the possibility to trigger CL services.

Proactive CL service

Another possibility to think about a more effective integration of mental health into hospital settings is proactive CL services. Proactive CL services aim to early detect mental health issues without relying on referrals of medical physicians. This reduces the barrier that physicians often do not recognize mental health conditions and, thus, no referrals to CL services is made (Chen et al., 2016). Generally, it was seen that CL services are more effective than collaborative care for depression and anxiety (Archer et al., 2012). Proactive CL services where patients are routinely screened through clinicians with mental health care expertise were suggested to reduce length of hospital stay (Oldham et al., 2019). However, the evidence is mainly based on results from the US and the Netherlands, and is inconclusive. Currently, a multicenter randomized controlled trial is going on in the UK where every patient is proactively assessed, but so far, no study results were published (Sharpe et al., 2020). Some studies, including a Swiss study using questionnaire-based screening, did not show any changes in length of stay (Camus et al., 2003, Oldham et al., 2021). It is possible that the way of screening, either through trained mental health specialists or questionnaires, is deciding on the success of such a proactive CL service (Oldham et al., 2019). While some studies recommend screening of mental health conditions in somatic settings (Chen et al., 2016, Walker et al., 2018), others refrain from these suggestions due to the low uptake and high investment of mental health screenings compared to the limited advantages (van Beljouw et al., 2014). One advantage of questionnaire-based screening is, however, the lower resources needed compared to screening through mental health specialists. Particularly, when thinking about a setting that is characterized by generally high workload and thus, limited time resources available (CHAPTER 4 and CHAPTER 5)

De-implementation

The limited time resources mentioned by all interviewees (CHAPTER 4 and CHAPTER 5) put emphasis on an important barrier when implementing new service models into

hospital settings. Even if physicians and nurses only have to answer a single question on the perceived psychosocial distress of their hospital patients, they stated the difficulty to implement it in their tight daily working routine. Thinking about priorities and optimization of this working routine is, thus, essential to be able to adapt current systems and processes to new evolving needs of healthcare systems – a learning health system (LHS). Talking to healthcare professionals and evaluating their daily routines to set priorities and probably de-implement tasks/routines that are not needed anymore due to limited evidence base and low priority may support optimization of time use in the hospital setting.

Long-term investment – from biomedical to biopsychosocial model through learning health systems

Secondary prevention offered through the SCCM by early detecting psychosocial distress in Swiss hospital patients may help to reduce the burden of mental health conditions. The overall burden in Switzerland remained consistently high (Institute for Health Metrics and Evaluation (IHME), 2020), which asks for changes in the system. Focusing on populations with somatic disease may diminish the individual and societal burden through reduced healthcare costs. However, data on mental health of hospital patients are inconclusive and not up-to-date, which can be counteracted by routine screenings (Walker et al., 2018). Data on the prevalence of mental health conditions in hospital patients support tailoring appropriate interventions on an individual level but also on the systems level. System changes are particularly required keeping the epidemiological transition in mind.

The epidemiological transition from infectious to chronic diseases including mental health conditions took place decades ago. Still, the healthcare system focuses on acute care. This asks for LHS (Friedman et al., 2017). To achieve this, interprofessional and interdisciplinary work is needed (Friedman et al., 2017). One initiative aiming to strengthen interdisciplinary work by bringing together stakeholders from research, practice, and policy is the SLHS (Boes et al., 2018). Keeping LHS in mind, data on the implementation

of new service models helps to understand opportunities and challenges of this specific service model. This allows to adapt the model until it fits the needs of the healthcare system. However, this is a continuous, never-ending process because the needs may change with time and based on new evidence on health, healthcare, and related disciplines (Friedman et al., 2017). LHS may help to integrate cultural, social, and psychological aspects into the current somatic focused hospitals. Like this, the hope is to come from the biomedical to the biopsychosocial model where hospital patients are seen in a holistic manner respecting all aspects of their life.

CONCLUSION

With changing needs of patients, healthcare systems will have to adapt. In this thesis, we investigated the determinants affecting the implementation of a new service model, a SCCM, to better integrate mental health into hospitals, the feasibility of integrating mental health into current hospital settings, and the changing mental health needs of hospital patients during the COVID-19 pandemic. Big Data may be a future approach to support evaluations of new service models and observe changing needs due to external factors like the COVID-19 pandemic. Thus, we assessed advantages and disadvantages of Big Data to monitor mental health.

Hospitals offer a unique platform to monitor mental health of particularly vulnerable populations with mental–somatic multimorbidities. However, the strong somatic focus and current structures at hospitals remain challenging factors when integrating mental health into this setting. When implementing new service models, like a SCCM, teams have to be aware of these challenges and should involve healthcare professionals from all levels to enhance awareness, adherence, and sustainability. Interprofessional and multidisciplinary collaboration within and outside the hospital setting have to be strengthened that the entire SCCM can succeed and patients with mental–somatic multimorbidities receive the support they need. This allows the SCCM to be a model of good clinical practice at the interface of somatic and mental health, and thus, to support

handling of mental–somatic multimorbidities in hospital settings in Switzerland. However, the challenges observed in the implementation of the SCCM ask for paradigm changes. LHS are needed to adapt to current needs and evidence base in healthcare. Particularly to change the healthcare system from an acute/biomedical focus to a more biopsychosocial model with holistic care for patients.

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Appendix

Appendix 1 Interview Guide: mental health in general hospitals (CHAPTER 4)

Information

Hi, thanks for taking the time to talk to me.

- Presentation of interviewer (NJA)
- Informed consent
    - Aim: How is mental health integrated on the hospital wards?
    - Approved by ethics committee
    - Participation is voluntary and can be withdrawn at any time.
    - The interview is recorded and will be transcribed.
    - Data are encrypted and password-protected.
    - Only authorized persons have access on un-encrypted data and these people are bound to secrecy.
- There are no right or wrong answers, but interested in collected experiences and impressions.
- Indicate if you don't want to answer a question.
- Are there any questions?
- Sign consent
- Turn on audio-recorder

Introduction

1. What is your profession?
    - How long have you been working in this profession?
    - What do you like most about this profession?
    - What do you dislike about this profession?

Knowledge about/experiences with mental health of patients

2. Have you ever been confronted with people who were suffering from physical and mental conditions?
    - Could you please tell me more about that?
    - At work? In private?
    - How was this for you?
3. Have you ever had any experiences with somatic patients who also suffered from a mental condition during your work? (only health professionals)
    - Could you please tell me more about such a patient?
    - How was this for you?
    - How did you behave in this situation?
    - Have you had any support by others?

- Did you change anything in the treatment of this patient?
- How would you describe these patients?
- What is the best part when working with these patients?
- What is the worst part when working with these patients?

4. Were you ready to handle somatic patients who have mental conditions?
   - How did you prepare yourself for these patients? / What was missing to be prepared for these patients?
   - What would you have needed to be prepared for these patients?

Processes of somatic patients with mental conditions

5. Is there a standard procedure in case of a somatic patient additionally suffering from a mental condition?*
   - What does this procedure look like?
   - Who do you inform if you think that a patient is suffering from a depression or anxiety?
   - When do you inform [the above mentioned person]?
6. What do you like the most about this procedure?
7. What do you like the least about this procedure?
8. Which role do you have regarding communication between the wards? (only administration personnel)
   - What do you like about this?
   - What do you dislike about this?
9. How does the communication between the wards work if, for instance, problems are arising? (only administration personnel)
   - Who should you approach?
   - What happens next?
   - What do you like about this?
   - What do you dislike about this?
10. Are there any plans for changes in handling somatic patients who have mental conditions such as depression or anxiety? Which ones?
    - From your point of view, what is the purpose of these plans?
    - Have you ever heard about SomPsyNet? What? When? In which context?
    - What is your role in this project?
11. Which role did or do you have in the planning of SomPsyNet? (only personnel who were involved in planning)
    - Could you please tell me more about this?
    - What do you like the most about the planning of this project?
    - What do you like the least about the planning of this project?
    - What would you do differently, if you could plan the project?
    - What would you do the same way, if you could plan the project?
    - What are the differences of SomPsyNet with other projects?
    - What are the similarities of SomPsyNet with other projects?
12. Why do you think is the testing of mental conditions such as depression and anxiety implemented?
13. What is the priority/emphasis of the testing of mental conditions such as depression or anxiety in comparison with other tasks you have?
14. Do you think that the testing and treatment of somatic patient with mental conditions such as depression or anxiety could lead to better results? Be it for patients, but also physicians, nurses or the health system?
15. Do you or your colleagues have any problems with testing patients for mental conditions? Which ones?

16. Within this project, somatic patients are asked questions about mental health: How do think the patients will react to these questions?
    - Could you please tell me more about this?
    - What are examples for positive reactions?
    - What are examples for negative reactions?

Personal view

17. What would you say: Which role does mental health play in somatic patients?
    - Are you talking with someone about this topic? Colleagues? Family? Friends?
    - What are you talking about?
    - When do you talk about this?
    - How often do you talk about this?

Closing

18. Is there anything else you would like to add about this topic of mental health or the procedures at the hospital?

[turn off audio-recorder]

Again, I would like to thank for your time. It was an interesting and informative discussion. If you have any questions or anything to add later, you can contact me. You can find my contact dates on your copy of the informed consent form

Appendix 2 SomPsyNet Consortium (CHAPTER 4)

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Appendix 3 Interview Guide: psychosocial distress assessment (CHAPTER 5)

Information

Hi, thank you for taking the time to talk to me.

- Presentation of interviewer (NJA)
- Informed consent:
    - Aim: How is mental health integrated on the hospital wards?
    - Approved by ethics committee.
    - Participation is voluntary and can be withdrawn at any time.
    - The interview is recorded and will be transcribed.
    - Data are encrypted and password-protected.
    - Only authorized persons have access to un-encrypted data and these people are bound to secrecy.
- There are no right or wrong answers, but we are interested in experiences and impressions collected during the project so far. There are also more general questions on guidelines.
- Indicate if you do not want to answer a question.
- Are there any questions?
- Sign consent
- Read the definition: "Psychosocial distress means that a patient is stressed, worried or under pressure. Often, these are difficulties related to following things: physical complaints or restrictions, emotional issues (e.g., sadness, depression, anxiety), family/children/friends, work/school, money or meaning of life/spirituality/faith."
- Turn on audio-recorder.

Introduction

1. Have you ever heard about the project SomPsyNet?
2. What is your role when assessing patients' psychosocial distress, thus within the project SomPsyNet?
    a. How does the assessment of psychosocial distress look?

Guideline Factors

3. Are the physicians and nurses familiar with the assessment of patients' psychosocial distress?
4. Do you and your colleagues have access to information about the assessment of patients' psychosocial distress?
5. In your opinion, are the people who developed the project SomPsyNet credible?
    a. Do you have any concerns regarding the credibility of these people? Which ones?
    b. In your opinion, do you think that the assessment of patients' psychosocial distress is evidence-based?
6. In your opinion, is the assessment of patients' psychosocial distress feasible?
7. In your opinion, how much effort is required to assess patients' psychosocial distress?
    a. What makes the assessment difficult?
    b. What makes the assessment easy?
    c. Is the assessment of patients' psychosocial distress consistent with other guidelines or recommendations you work with routinely?
    d. Can you detect any changes in patients through the assessment of psychosocial distress? In dealing with them? In patients' well-being?
    e. In your opinion which knowledge need physicians and nurses to correctly assess patients' psychosocial distress? Do physicians and nurses have this knowledge?
    f. What skills are needed to assess patient's psychosocial distress? Do physicians and nurses have these skills? Are they capable to assess patients' psychosocial distress?

Individual health professional factors

8. How do you and your colleagues view guidelines and standardization in general?
9. Do you and your colleagues think that the assessment of patients' psychosocial distress will lead to better outcomes? Meaning for patients, physicians/nurses, or the healthcare system?
    a. Do you and your colleagues assess patients' psychosocial distress?
    b. What concerns about assessing patients' psychosocial distress do you have?
    c. Do you have any concerns to assess patients' psychosocial distress although you assess psychosocial distress? Which ones?
10. How have processes regarding patients' psychosocial distress changed? (Who must do what different? When? Where? How? How often?)
    a. Do you have the capacity to do this?
    b. In your opinion, has the number of consultation changed? How?

Patient factors

11. How do you perceive patients' knowledge, needs, and expectations related to the assessment of psychosocial distress at the hospital?
    a. Do you perceive that patients have different values about the assessment of psychosocial distress than you or the recommendation? How do they differ/are similar?
    b. Have you or your colleagues any issues with assessing patients' psychosocial distress? Why?
    c. Do you know from any issues caused by the assessment of psychosocial distress?
12. Have you ever received direct feedback from patients? What feedback?

Professional interactions

13. Are there organizations, networks, or prevailing norms affecting the assessment of patients' psychosocial distress?
14. Are there team or workflow issues that affect the assessment of patients' psychosocial distress?
    a. Are changes needed in referral processes, or interactions with other systems or groups to be able to assess patients' psychosocial distress effectively?

Incentives and resources

15. What resources would be helpful in getting you or your colleagues to assess patients' psychosocial distress? (financial incentives, human resources, equipment and supplies, technical capacity, patient information or others)
    a. What financial incentives do you or your colleagues, system administrators, patients, and others have to assess psychosocial distress?
    b. How does the information system facilitate or hinder the assessment of patients' psychosocial distress?
    c. How does the quality assurance facilitate or hinder the assessment of patients' psychosocial distress?
    d. Do you or your colleagues have the assistance you need to assess patients' psychosocial distress? (checklists, patient information, decision aids, supervision)

Capacity for organizational change

16. What leadership or management support do you need to assess you or your colleagues in assessing patients' psychosocial distress?
17. In your opinion, is this support available, and do you and your colleagues know how to access it?
    a. Is the style of leadership helpful?
    b. Who supports the assessment of patients' psychosocial distress? Who does not or supports it less?
    c. How do internal and external rules, regulations, and policies help or hinder to assess patients' psychosocial distress?

18. How much of a priority is the assessment of psychosocial distress compared with other activities going on in your setting?
19. Is monitoring and feedback available? Would monitoring and feedback be useful?

Social, political, and legal factors

20. What do you think why the assessment of patients' psychosocial distress is implemented?
21. Optional: Are there any payer or funder policies that you are aware of that either help or hinder the assessment of psychosocial distress?
    a. Do influential people or groups outside the hospital help or hinder the assessment of patients' psychosocial distress?

Closing

22. Do you have any suggestions for improvement related to the assessment of patients' psychosocial distress?
    a. Are there any other issues we should talk about that have not come up yet?

[turn off audio-recorder]

Again, I would like to thank you for your time. It was an interesting and informative discussion. If you have any questions or anything to add later, you can contact me. You can find my contact dates on your copy of the informed consent form.

Appendix 4 Facilitators and barriers according to the TICD domains, themes, and subthemes, illustrated by representative quotes. (CHAPTER 5)

Themes	Subthemes	Representative quotes
Guideline factors		
Recommendation	Quality of evidence supporting the recommendation	"Yes, I would say, the way it is tested now, no, it is gut feeling. […] So the basis why it is tested is [evidence-based], yes." physician, age 26, female
	Clarity	"I think it would be difficult, because one has to determine 'okay, this is the definition and that has to be looked at or questioned for. This is it, I would say. If it is more gut feeling or if really determinants exist, which one would assess." physician, age 29, female
	Cultural appropriateness	I think it helps that we are a small house [hospital], because we do not have patients all the time, but maybe we have 15 [patients] a week or so. And this is far easier than 15 a day, 15 different ones." physician, age 27, female
	Accessibility of the recommendation	So far, I think, I did it [the psychosocial distress assessment] once. Just, somehow, because a nurse pointed out to me that apparently, we have to assess it [psychosocial distress] together." physician, age 29, female
	Source of the recommendation	"Yes, they [the SomPsyNet implementers] do not make an untrustworthy impression. But I feel like, one does not get into, they do not talk with us. Well, they are totally external. One thinks 'Ah, now there is someone.' But trustworthy, yes, definitely." nurse, age 56, female
	Consistency with other guidelines	"It is even a great addition, because we have many tools assessing the somatic aspects, but hardly any that do the mental assessment. And this makes it a great tool that complements everything, yes." nurse, age 28, male
Recommended clinical intervention	Feasibility	"Really, it is simply the time. Well, it is not that it is, somehow, cognitively high demanding, but it is that I have to take the time to discuss with the patient. I have to take the time to open it up [the assessment]. I have to take the time to enter it again. Exactly, and if I have it, the time, then everybody would do it for sure." physician, age 34, female
	Accessibility of the intervention	"So what I know is that it [the assessment] appears in the curve of each patient." physician, age 35, male

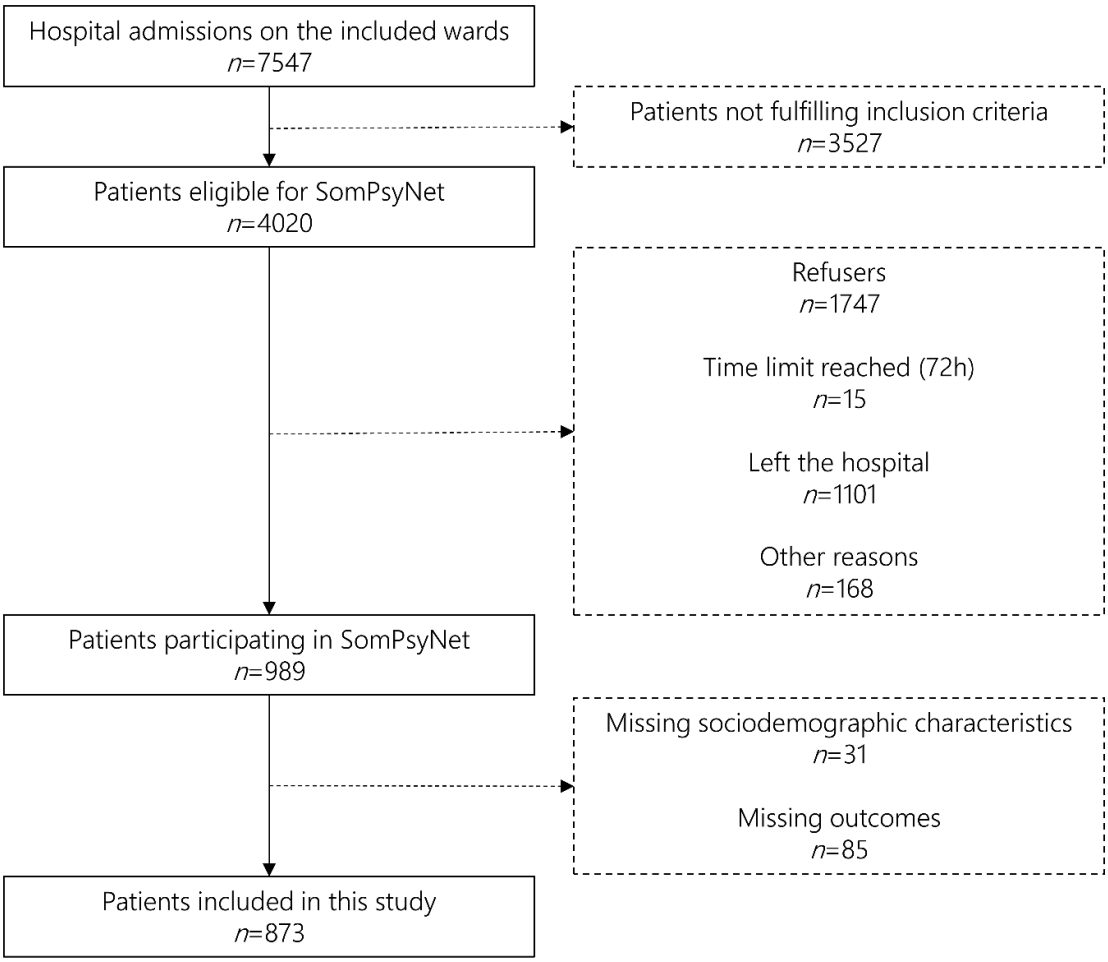
Recommended behavior	Compatibility	"Yes, that is actually something I pretty much always incorporate into my daily life anyway, well, if I care [for the patients], simply in the discussion." nurse, age 38, female
	Effort	"And through SomPsyNet, it is just extra work. This means I have to assess him [the patient], I have to enter it [the assessment], and this takes maybe only 2 minutes more per patient, but it is just, it sums up during everyday life. And over the days even more." physician, age 34, female "As said before, so it needs discussions with the patient for this assessment. We do not always have the time to do these conversations." nurse, age 42, female
	Observability	"At this time, I can say it certainly makes us somehow, one is more sensitized, but if this finally [helps] the patient – I do not know that." nurse, age 56, female
Individual health professional factors		
Knowledge and skills	Domain knowledge	"Well, it is simple, because we simply notice that patients – well some patients – they come to the hospital over and over again. Simply because there are many, many factors that they [the patients] can no longer manage at home. But these are not necessarily reasons for hospitalization." nurse, age 42, female
	Awareness and familiarity with the recommendation	"And organizational I would say it is very difficult for physicians, because the SomPsyNet project was presented once or twice or three times on our ward. And the nurses have actually a very constant team. This means that we actually all know what theoretically SomPsyNet is. But physicians, they change about all four weeks. This means that the generation of physicians we have here does actually not even know that SomPsyNet exists." nurse, age 28, male
	Knowledge about own practice	"I think, probably sometimes one thinks that this [the assessment] maybe has no consequence. So, I think if a patient is well, then one thinks 'yes, he/she [the patient] is probably not or only distressed a bit and it would probably not help much if this is further assessed." physician, age 31, male
	Skills needed to adhere	"You cannot generalize. This is not as simple. But I think we are very empathetic and therefore, we are popular. Because we can simply work on a more personal level and you can see that in the way we deal with each other." physician, age 27, female

Cognitions	Agreement with the recommendation	"Hmm, as said before, for me it is not yet tangible. It is…yes, I have to be convinced of the tool. Also that I complete it with full consciousness, and that I know what I do. And now, this is just my insecure clicking around based on gut feeling. Well, just casually said." nurse, age 29, male
	Attitudes towards guidelines in general	"Well, in principle I like any regulations. But I think I was and I still am not a fan of over-regulations, because afterwards there is no scope and there are always problems in medicine that are not white or black – it is always grey." physician, age 26, male
	Expected outcome	"Well, I do think that as soon as the study phase is over, one can take action and one can identify reasons, and one can prevent rehospitalizations. Yes, then, also patients' quality of life increases if one can find suitable actions or projects at home." nurse, age 46, female
	Intention and motivtation	"Well, I do it, because it has to be done. But I do not further think about how important it [the assessment] is. I just do it, because it has to be done. But I think, if I know more about it or if I have more information, I would take it more serious." nurse, age 35, female
	Self-efficacy	"I am just wondering if I am correct in my assessment? So did I assess correctly? Or am I wrong? Well, this is the only question I have. I do not want to give a very bad or very positive assessment although it is not the case. I do not want to miss a problem." nurse, age 42, female
	Learning style	"I think there was someone here where you could go [to the training] and unfortunately, I missed it. I would have preferred that, but yes, it is my own fault." nurse, age 38, female Well, one has to demonstrate it to me – that is the best way I learn. If there are clips that explain this well, yes." nurse, age 35, female
	Emotions	"Yes, the more I am distressed, the worse I make the assessment." physician, age 34, female
Professional behavior	Nature of the behavior	"[…] and that we can then once make a general assessment of the psychosocial distress of the patient during hospitalization. And this I do with a click on a scale, which, I think, is from zero to ten or green to red. And the assessment is relatively intuitive, is he [the patient] distressed or not and I just make it, one click, yes." physician, age 35, male

Patient factors		
Patient needs		"For many it is important. For some it is important that one addresses it [psychosocial distress]. For others, no, they want to be left alone. Many. They say that nobody can do anything about it." nurse, age 35, female
Patient beliefs and knowledge		"Well, I do not know if they [patients] even are aware that this [psychosocial distress assessment] is going on. We just do it independently. We do not bring up that this exists. We just tick it." physician, age 26, female
Patient motivation		"It is important to them to hand over the survey or what they have to complete. This is very important to them that someone is coming. We notice that." nurse, age 46, female
Patient behavior		"Well, I think some patients can express relatively well what they need and whether they think that they can profit. But for many patients, one does not know. One has to offer that a bit empirically. And sometimes it works and sometimes not at all." physician, age 31, male "And I think it is only easy with extrovert personalities, if they just tell you that there is something else and that is why they [the patients] are nervous. There are people who very quickly confide very personal things, but mostly that is not the case." nurse, age 49, female
Professional interactions		
Communication and influence		"And maybe, if the physician decided in advance, I think one adapts automatically a bit. This means physicians to nurses and the other way around. I think one orients oneself a bit if one does not know exactly [how to assess the patient]. Well, before one omits it, one orients oneself on the person who assessed in advance." nurse, age 29, male
Team processes		"At the hospital, we have many interprofessional discussions and there, many things are done and one discusses about it [the distress of patients]. Each patient has, I do not know, five or ten minutes a week. And I believe, it is important to have a common goal for the patient." nurse, age 23, female
Referral processes		"Well, we all know the system and we know how to trigger consultations – this is actually clear. And I think we do not have to write a lot for consultations." physician, age 29, female
Incentives and resources		

Availability of necessary resources		And that is why I think that the resources like the holistic care, having time for the entire human, are no longer a goal. And from that, it is not simply a resource, a technical mean or as said before, what would help me." nurse, age 49, female
Financial incentives and disincentives		"I only can imagine if there is actually a psychosocial problem leading to a hospitalization and if one can somehow solve it sustainably that costs could be reduced." physician, age 26, female
Nonfinancial incentives and disincentives		"Yes, it is more that we did not really received a training. It is more 'do it now', without any background information except the sentence that comes with the assessment explaining what it is about. And this makes it a bit difficult for me. Yes, probably, it would have been awesome to have a short – a quarter – information what it is about. So that one knows a bit what to look out for. Just a bit what the background thoughts are or what is planned with it [the assessment]. We did not learn about all of this." physician, age 26, female "[…] a year ago, we heard about it. And then, we had a second meeting where it was explained how we should do that, why it [the assessment] should be done, what the goal is and why it is done." nurse, age 42, female
Information system		"[…] I would like to see the score or if it is done at all. Because in our case, it displays only SomPsyNet and that is it. And then, one does not know is it done, is it not done, is it a good score, is it a bad score." nurse, age 27, female
Quality assurance and patient safety system		"Well, neither nor. I did not associate it [the assessment] with quality assurance." nurse, age 56, female
Continuing education system		"Yes, maybe it would be great to again have an input of the study team who comes again and maybe tell again what it actually is about and how important it is. And just revive." nurse, age 38, female
Assistance for clinicians		"I feel like this assessment with a scale from zero to ten is a bit difficult, because what means ten and what means zero? And it is very personal and I do not know if maybe two/three questions would be better, because then, it would not be so – it is very personal, as I said before." nurse, age 23, female
Capacity for organizational change		

Capable leadership		"Well, sure our management who for sure affects it [SomPsyNet] positively, because she fully support it and if she has information, it is always in our weekly information. And she said now and then 'remember the SomPsyNet project! If you have any questions, pass by at any time.' Or if something happened, she always took care of it." nurse, age 28, male
Relative strength of supporters and opponents		"Also, it [SomPsyNet] is promoted and desired by the house [hospital]. This makes one feel to do something important." nurse, age 46, female
Priority of necessary change		Honestly, a very low one [priority]. Because, in fact, it is all according to the urgency. Well, if somehow the medication is not administered, then I have the consequences, so I will administer it [the medication] 100%. If I do not document it, then everybody sees it and the nursing process cannot be guaranteed, so I will do it for sure. If I do not document SomPsyNet, nothing happens at all and that is why, so to say, if one looks at the ranking, it is pretty much the lowest one on the hierarchy that has to be completed. Yes, because it just does not have any consequences, direct ones, on the daily routine." nurse, age 28, male
Monitoring and feedback		"Yes, she always say that it is good. But generally, for everybody. She thinks it is great that everybody completes it always. And yes, if it is not completed, she calls to ask that one does it." nurse, age 35, female
Social, political and legal factors		
Influential people		Well, I do not know, but I think, in politics, of course, this is something exciting, because they are maybe interested in reducing hospitals and costs. Without really having the wish in terms of content, one thinks that such a project is still promising." nurse, age 49, female



Appendix 5 SomPsyNet recruitment and inclusion in analyses between June 9, 2020, and April 17, 2021. (CHAPTER 6)

Appendix 6 Interrupted Time Series Regression Analyses of percentage of distressed inpatients according to the mental health assessment tools (*N* = 873). (CHAPTER 6)

	Coefficient (95%-CI)	p-value
Anxiety (GAD-7)		
Time trend	0.01 (-0.11 to 0.12)	0.903
Change in mean (level)	-18.25 (-46.58 to 10.07)	0.206
Change in time trend (slope)	0.06 (-0.09 to 0.22)	0.393
Depression (PHQ-8)		
Time trend	-0.01 (-0.15 to 0.12)	0.849
Change in mean (level)	-17.46 (-49.83 to 14.91)	0.290
Change in time trend (slope)	0.06 (-0.11 to 0.25)	0.460
Somatic Symptom Disorder (SSD-12)		
Time trend	-0.02 (-0.13 to 0.23)	0.745
Change in mean (level)	-14.44 (-47.51 to 18.64)	0.392
Change in time trend (slope)	0.05 (-0.13 to 0.23)	0.600
Mental Quality of Life (SF-36v1 MCS)		
Time trend	0.03 (-0.08 to 0.13)	0.605
Change in mean (level)	-3.34 (-26.21 to 19.52)	0.774
Change in time trend (slope)	-0.00 (-0.14 to 0.13)	0.981

Results are adjusted for sex, age group, nationality, education level, marital status, weekly incidence of COVID-19 infections in Basel-Stadt, and hospital.

CI = Confidence Interval

GAD-7 = 7-item General Anxiety Disorder questionnaire

PHQ-8 = 8-item Patient Health Questionnaire

SSD-12 = 12-item Somatic Symptom Disorder questionnaire

SF-36v1 = Short Form 36, version 1

MCS = mental component summary

Appendix 7 Interrupted Time Series Regression Analyses of distress scores (*N* = 873). (CHAPTER 6)

	Coefficient (95%-CI)	p-value
Anxiety (GAD-7)		
Time trend	0.01 (-0.00 to 0.02)	0.186
Change in mean (level)	0.10 (-3.40 to 3.59)	0.956
Change in time trend (slope)	-0.01 (-0.03 to 0.01)	0.382
Depression (PHQ-8)		
Time trend	0.01 (-0.01 to 0.02)	0.386
Change in mean (level)	-0.71 (-4.38 to 2.97)	0.706
Change in time trend (slope)	-0.00 (-0.02 to 0.02)	0.812
Somatic Symptom Disorder (SSD-12)		
Time trend	-0.00 (-0.03 to 0.03)	0.824
Change in mean (level)	-5.06 (-12.52 to 2.41	0.184
Change in time trend (slope)	0.02 (-0.02 to 0.06)	0.417
Mental Quality of Life (SF-36v1 MCS*)		
Time trend	-0.03 (-0.10 to 0.03)	0.316
Change in mean (level)	-2.10 (-17.23 to 13.03)	0.786
Change in time trend (slope)	0.03 (-0.05 to 0.12)	0.453

Results are adjusted for sex, age group, nationality, education level, marital status, weekly incidence of COVID-19 infections in Basel-Stadt, and hospital.

* A higher score indicates better mental health.

CI = Confidence Interval

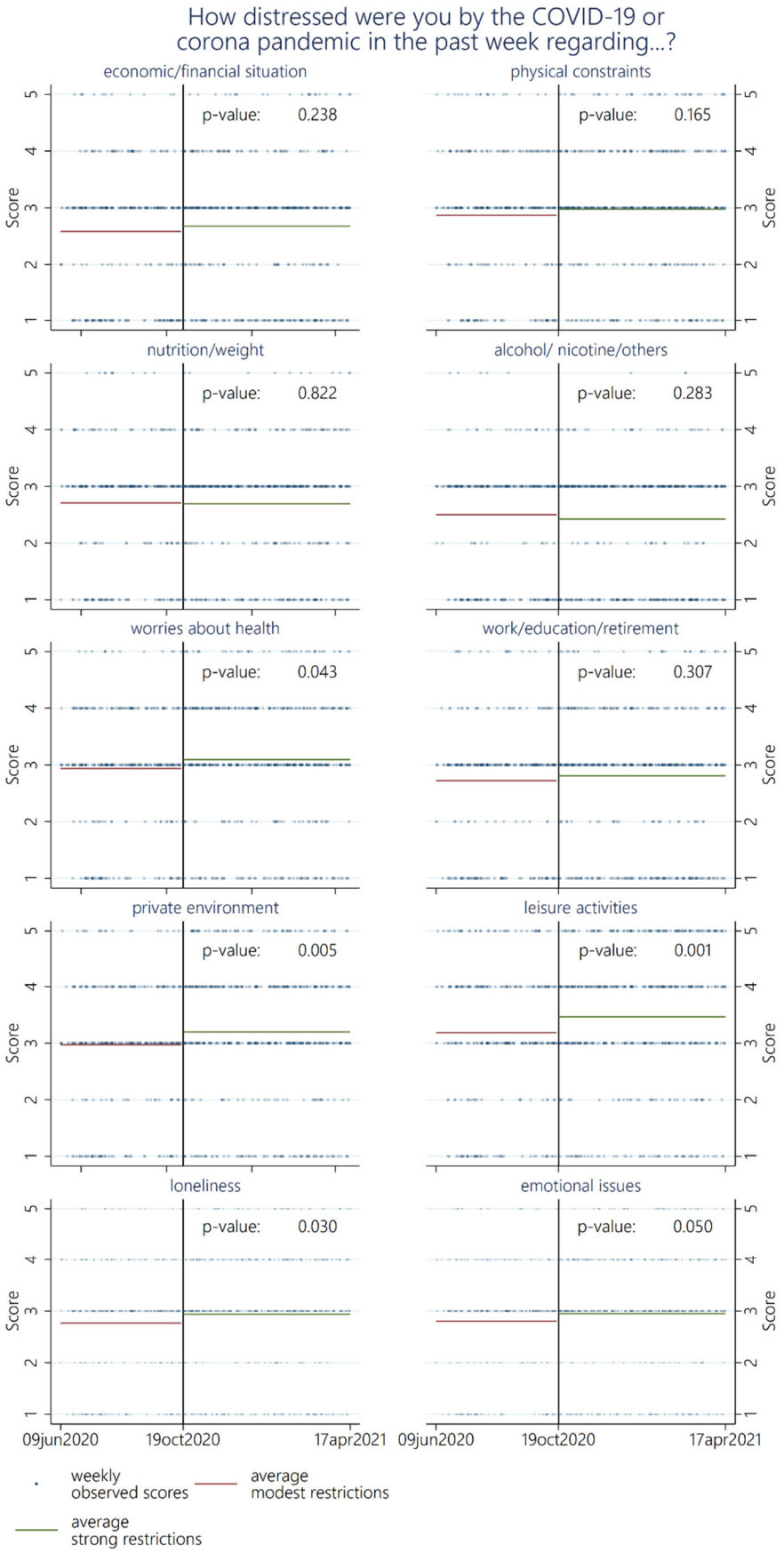
GAD-7 = 7-item General Anxiety Disorder questionnaire

PHQ-8 = 8-item Patient Health Questionnaire

SSD-12 = 12-item Somatic Symptom Disorder questionnaire

SF-36v1 = Short Form 36, version 1

MCS = mental component summary


How distressed were you by the COVID-19 or corona pandemic in the past week regarding...?
economic/financial situation
p-value: 0.238
physical constraints
p-value: 0.165
nutrition/weight
p-value: 0.822
alcohol/ nicotine/others
p-value: 0.283
worries about health
p-value: 0.043
work/education/retirement
p-value: 0.307
private environment
p-value: 0.005
leisure activities
p-value: 0.001
loneliness
p-value: 0.030
emotional issues
p-value: 0.050
Score
09jun2020
19oct2020
17apr2021
weekly observed scores
average modest restrictions
average strong restrictions

Appendix 8 Stated distress scores of inpatients due to coronavirus disease 2019 (COVID-19) pandemic in the respective life area between the pre-period of modest and the post-period of strong COVID-19 restrictions (*N* = 873). P-values are based on unadjusted linear regression analyses. (CHAPTER 6)

Appendix 9 Changes in the mean score of reported distress (one to five) due to the coronavirus disease 2019 (COVID-19) pandemic in specific life areas from periods of modest to strong COVID-19 restrictions based on linear regression models, stratified by sex and age group (*N* = 873). (CHAPTER 6)

	Mean change of COVID-19-related distress score (95%-CI)				
	All	Male	Female	<65 years	≥65 years
Finances	0.05 (-0.15 to 0.25)	0.23 (-0.09 to 0.55)	-0.09 (-0.37 to 0.18)	-0.04 (-0.33 to 0.25)	0.17 (-0.13 to 0.46)
Physical complaints	0.13 (-0.06 to 0.33)	0.17 (-0.16 to 0.49)	0.09 (-0.16 to 0.34)	-0.07 (-0.33 to 0.19)	0.34* (0.04 to 0.63)
Nutrition	0.01 (-0.17 to 0.20)	0.17 (-0.12 to 0.46)	-0.11 (-0.37 to 0.14)	-0.10 (-0.37 to 0.16)	0.12 (-0.15 to 0.40)
Alcohol, nicotine, others	-0.13 (-0.32 to 0.05)	-0.02 (-0.30 to 0.27)	-0.19 (-0.44 to 0.06)	-0.17 (-0.42 to 0.08)	-0.11 (-0.38 to 0.17)
Worries about health	0.06 (-0.13 to 0.26)	0.16 (-0.16 to 0.48)	0.01 (-0.25 to 0.27)	0.12 (-0.15 to 0.38)	-0.03 (-0.33 to 0.27)
Profession	-0.01 (-0.21 to 0.19)	0.02 (-0.30 to 0.33)	-0.02 (-0.29 to 0.25)	0.01 (-0.28 to 0.29)	-0.08 (-0.37 to 0.21)
Private environment	0.08 (-0.12 to 0.29)	0.13 (-0.20 to 0.46)	0.04 (-0.23 to 0.31)	0.01 (-0.26 to 0.28)	0.11 (-0.21 to 0.43)
Leisure time	0.32** (0.11 to 0.54)	0.32 (-0.04 to 0.68)	0.33* (0.04 to 0.61)	0.29 (-0.00 to 0.59)	0.35* (0.02 to 0.67)
Loneliness	0.17 (-0.02 to 0.37)	0.29 (-0.03 to 0.62)	0.12 (-0.15 to 0.38)	0.05 (-0.23 to 0.32)	0.32* (0.03 to 0.62)
Emotional issues	0.16 (-0.04 to 0.35)	0.23 (-0.10 to 0.55)	0.14 (-0.11 to 0.39)	0.06 (-0.21 to 0.33)	0.25 (-0.04 to 0.54)

Results are adjusted for sex, age group, nationality, education level, marital status, weekly incidence of COVID-19 infections in Basel-Stadt, and hospital.

* p-value < 0.05; **p-value ≤ 0.01; *** p-value ≤ 0.001

CI = Confidence Interval

Appendix 10 Sex and age differences in changes in the percentage of inpatients reporting slightly or substantially more distress due to the coronavirus disease 2019 (COVID-19) pandemic in specific life areas, and changes in social support score from periods of modest to strong COVID-19 restrictions based on equal coefficient analyses (*N* = 873). (CHAPTER 6)

	Percentage change (95%-CI)	
	Sex (reference male)	Age (reference <65 years)
Finances	0.67 (-9.43 to 10.77)	4.10 (-5.58 to 13.79)
Physical complaints	12.48* (0.61 to 24.35)	4.68 (-7.05 to 16.42)
Nutrition	-3.24 (-12.77 to 6.30)	4.14 (-5.26 to 13.55)
Alcohol, nicotine, others	1.98 (-5.03 to 9.00)	0.79 (-5.79 to 7.37)
Worries about health	9.58 (-3.07 to 22.23)	-12.70* (-25.37 to -0.03)
Profession	8.33 (-1.75 to 18.41)	-14.47** (-24.40 to -4.54)
Private environment	6.65 (-6.39 to 19.69)	-4.93 (-17.87 to 8.00)
Leisure time	3.32 (-10.43 to 17.06)	3.43 (-10.22 to 17.08)
Loneliness	4.80 (-6.86 to 16.45)	2.19 (-9.41 to 13.79)
Emotional issues	11.67* (0.37 to 22.97)	-0.61 (-11.93 to 10.70)
	Change in mean social support score[§] (95%-CI)	
Social support (OSSS-3)	0.00 (-0.00 to 0.00)	0.00 (-0.00 to 0.00)

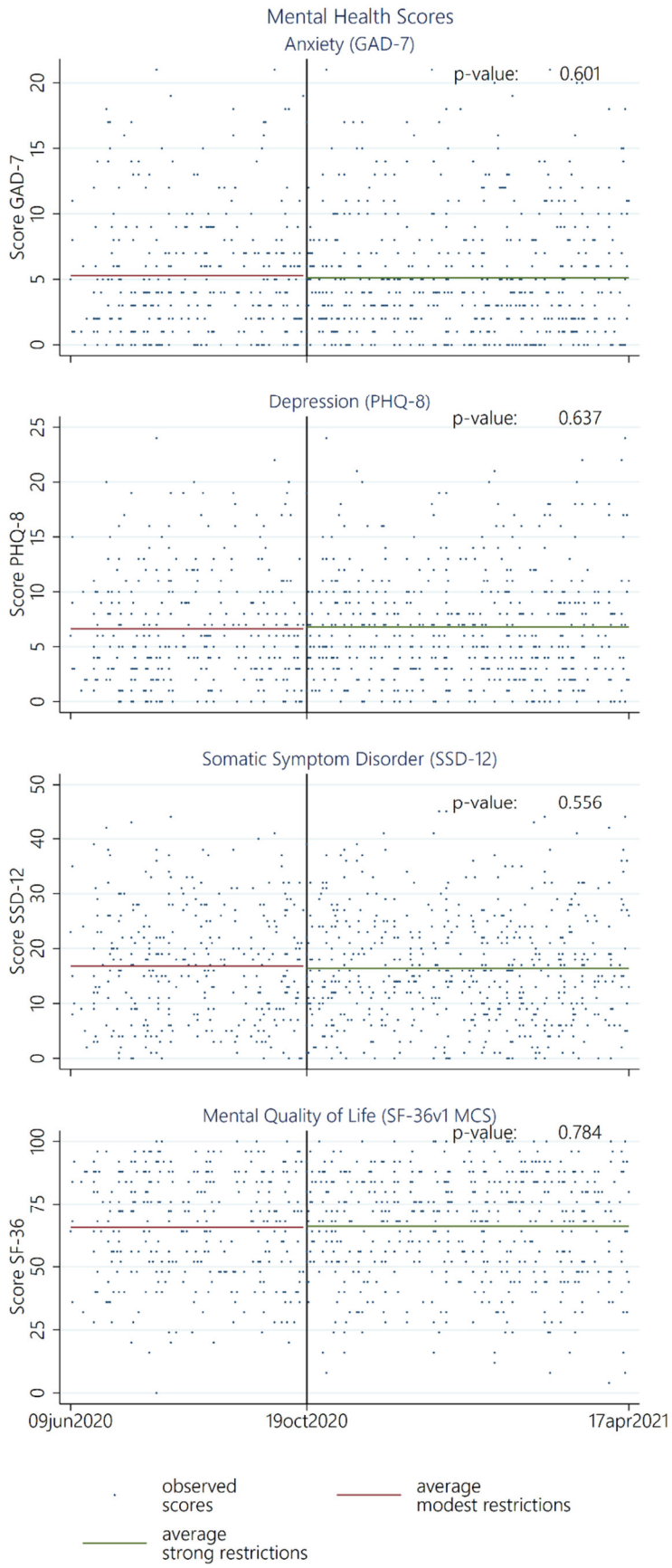
Results are adjusted for nationality, education level, marital status, weekly incidence of COVID-19 infections in Basel-Stadt, and hospital.

* p-value < 0.05; **p-value ≤ 0.01; *** p-value ≤ 0.001

[§] Score from one (poor support) to three (strong support)

CI = Confidence Interval

OSSS-3 = Oslo Social Support Scale


Mental Health Scores
Anxiety (GAD-7)
p-value: 0.601
Score GAD-7
0
5
10
15
20
Depression (PHQ-8)
p-value: 0.637
Score PHQ-8
0
5
10
15
20
25
Somatic Symptom Disorder (SSD-12)
p-value: 0.556
Score SSD-12
0
10
20
30
40
50
Mental Quality of Life (SF-36v1 MCS)
p-value: 0.784
Score SF-36
0
25
50
75
100
09jun2020
19oct2020
17apr2021
observed scores
average modest restrictions
average strong restrictions

Appendix 11 Comparison of distress scores between the pre-period of modest and the post-period of strong coronavirus disease 2019 (COVID-19) restrictions (*N* = 873). P-values are based on unadjusted linear regressions. (CHAPTER 6)
GAD-7 = 7-item General Anxiety Disorder questionnaire
PHQ-8 = 8-item Patient Health Questionnaire
SSD-12 = 12-item Somatic Symptom Disorder questionnaire
SF-36v1 = Short Form 36, version 1
MCS = Mental Component Summary

Appendix 12 Changes in the mean score of distress according to the mental health assessment tools from modest to strong coronavirus disease 2019 (COVID-19) restrictions based on linear regression models (*N* = 873). (CHAPTER 6)

	Mean change of mental health scores (95%-CI)
Anxiety (GAD-7)	-0.31 (-1.14 to 0.51)
Depression (PHQ-8)	-0.07 (-0.95 to 0.81)
Somatic Symptom Disorder (SSD-12)	-1.04 (-2.79 to 0.72)
Mental Quality of Life (SF-36v1 MCS*)	0.20 (-3.57 to 3.97)

Results are adjusted for sex, age group, nationality, education level, marital status, weekly incidence COVID-19 infections in Basel-Stadt, and hospital.

*A higher score indicates better mental health

CI = Confidence Interval

GAD-7 = 7-item General Anxiety Disorder questionnaire

PHQ-8 = 8-item Patient Health Questionnaire

SSD-12 = 12-item Somatic Symptom Disorder questionnaire

SF-36v1 = Short Form 36, version 1

MCS = mental component summary