Portal to care: general practitioners' decision-making on child and youth mental health problems and the influence of their (lived) experience

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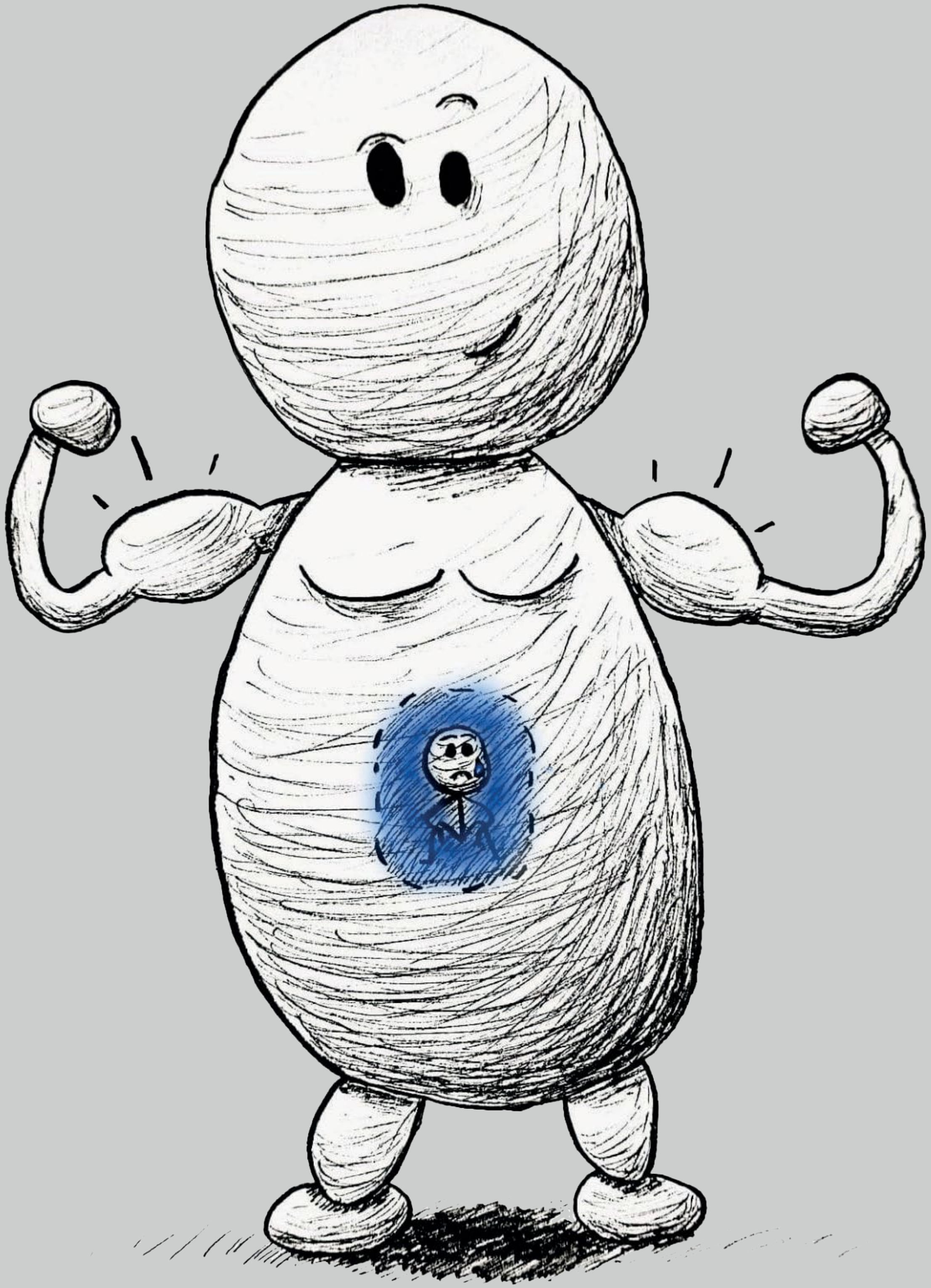
Citation

Venrooij, L. T. van. (2024, April 3). *Portal to care: general practitioners' decision-making on child and youth mental health problems and the influence of their (lived) experience*. Retrieved from https://hdl.handle.net/1887/3736110



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Lennard Theodore van Venrooij

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Proefschrift

ter verkrijging van
de graad van doctor aan de Universiteit Leiden,
op gezag van rector magnificus prof.dr.ir. H. Bijl,
volgens besluit van het college voor promoties
te verdedigen op woensdag 3 april 2024
klokke 16.15 uur
door
Lennard Theodore van Venrooij
geboren te Woubrugge
in 1992

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Leden promotiecommissie

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Colophon

Cover design: Lennard van Venrooij & UFB - Grafisch Centrum
Layout and print: UFB - Grafisch Centrum

This research was financially supported by Holland Rijnland.

Financial support for the publication of this thesis by Curium-LUMC is gratefully acknowledged.

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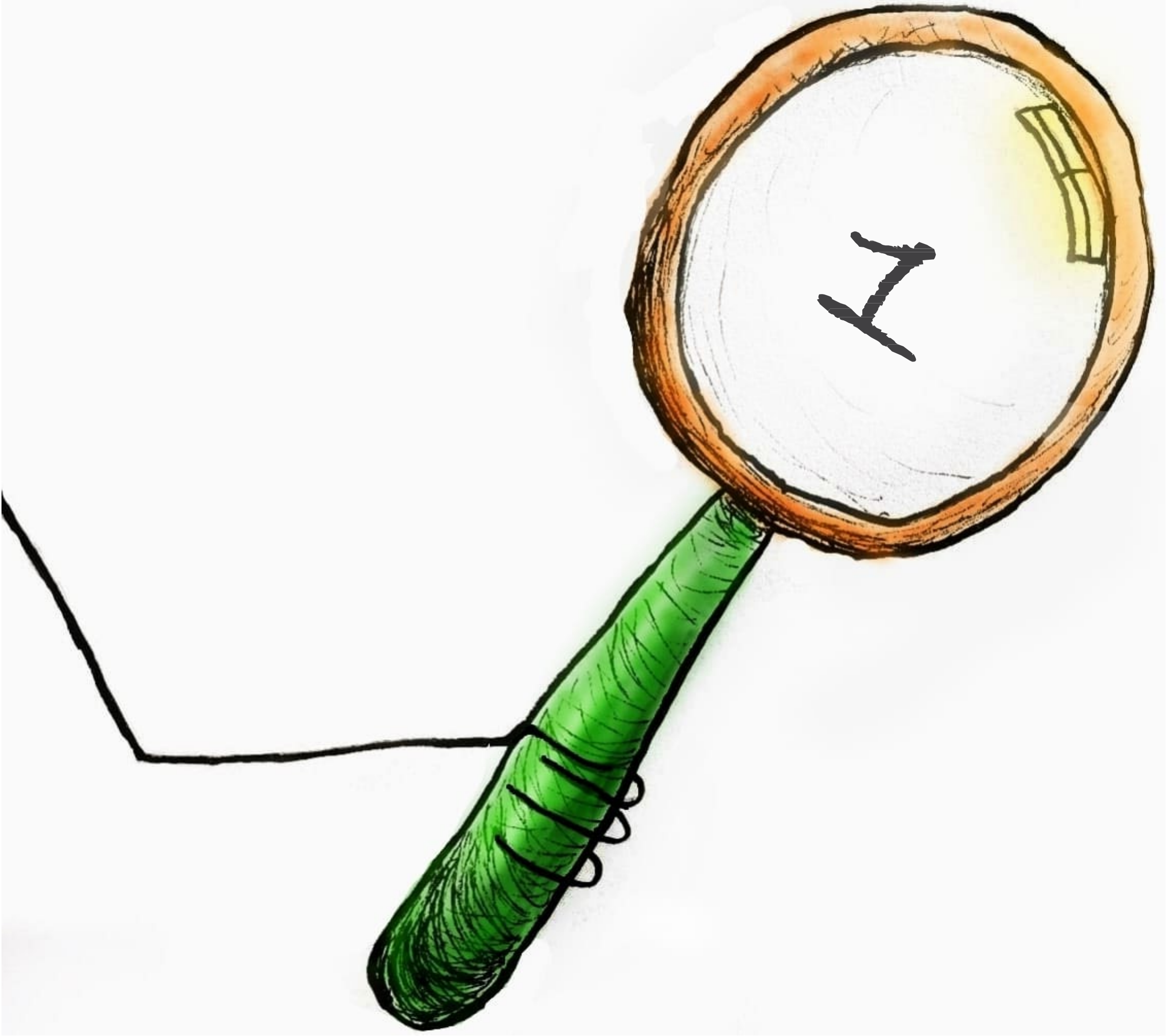

Chapter 1 - General introduction

Prevalences, causes and consequences of mental health problems in children and youths

Children and adolescents constitute almost a third (2.2 billion) of the world's population (Kieling et al., 2011). They undergo rapid biological, psychological and social transitions during early life. During this period, children and adolescents can experience high levels of emotional distress, which may result in mental health problems (Martinez et al., 2006). Mental health problems are a leading cause of health-related burden, accounting for 15-30% of the disability-adjusted life-years (DALYs) lost during the first three decades of life (Kieling et al., 2011). It is estimated that 10-20% of children and adolescents have some sort of mental health problem (World Health Organization, 2021). Studies show that in the United States, Attention Deficit Hyperactivity Disorder (ADHD), anxiety problems, behaviour problems and depression are the most commonly diagnosed mental health problems in children and adolescents aged 3-17 years old (Bitsko et al., 2022). In Europe, depression and anxiety disorders fall into the top 5 causes of overall disease burden in this population (World Health Organization, 2023).

Mental health problems tend to be underdiagnosed and undertreated for several reasons. These reasons include comorbidity with other non-psychiatric problems and somatization of emotional distress (Martinez et al., 2006), as well as a gap between the increasing demands for mental health services and the limited supply of these services (Olfson et al., 2014; Braddick et al., 2009). If left unexplored, mental health problems can have long-term consequences that impact academic and employment histories, as well as health behaviours in adult life (Roberts et al., 2014). Furthermore, families may be affected emotionally, mentally and sometimes physically (Van Tongerloo et al., 2014). On a community level, mental health problems may lead to high social costs in terms of reduced productivity (Braddick et al., 2009). Also, they impact health systems, social services, education services and youth justice systems in terms of increased financial costs (Suhrcke et al., 2008). In the United States, childhood mental health conditions had a total annual cost of $247 billion (Berdahl et al., 2010). As for the 27 European Union-countries and the United Kingdom, all mental health problems are estimated to cost more than €600 billion per year (European Commission, 2023).

Importance of GPs' clinical decision-making and factors influencing this process

The prevalence of mental health problems among children and youths in primary care is as high as 30-40% (Haller et al., 2009). As timely treatment is important to avoid aforementioned consequences, general practitioners (GPs) are in an unique position to detect mental health problems in children and youths and refer them to specialist services (Koposov et al., 2017). Despite frequent encounters, GPs experience barriers regarding their clinical decision-making (CDM) for detecting and managing these problems. Presentations are often complex and challenging for GPs to untangle, due to multidimensionality and coexistence with physical complaints (Koning et al., 2019; Roberts et al., 2014). Children and youths with mental health problems tend to wait long before they consult their GP. When they attend, they consult more frequently compared to their healthy peers, but are reluctant to disclose their problems (Verhaak et al., 2015; Kramer and Garralda, 2000). Furthermore, GPs feel often ill-equipped to manage mental health problems in children and youths with respect to their clinical training, communication skills and spendable consultation time, regardless of their age and work experience (Roberts et al., 2014; Koposov et al., 2017). There are also factors which facilitate GPs' CDM; i.e. GPs being parents themselves, knowledge about the neurobiological development occurring in puberty, and closer working relationships with secondary mental health care colleagues (Roberts et al., 2014). GPs report that they refer to mental health services if their patients fail to respond to treatment, have severe affective symptoms or require ongoing psychotherapy (Williams et al., 2005). Such referrals occur quite frequently, with roughly 1 in 5 of young people between 13-18 years who present in general practice being referred to any mental health care, with a substantial

GP as a gatekeeper

Depending on the country (examples include the Netherlands, UK and Australia), GPs function as a *gatekeeper*. Gatekeeping means that patients have to see a GP who decides whether specialist care is necessary. Such referral regulates the access to specialty care, hospital care or diagnostic tests (Onion and Berrington, 1999; Clarke, 2021; Dunnink and Lijs-Spek, 2008).

proportion being referred to (more costly) secondary mental health care (Zwaanswijk et al., 2011). Frequent referrals pose an additional burden on already minimal community-based resources, which in turn lead to a lack of referral options for GPs (Verhaak et al., 2015; Koposov et al., 2017). Despite well documentation of cost-saving benefits of children and youths receiving appropriate, effective and evidence-based care in primary care settings, not much is described in the literature about GPs' everyday CDM or methods to support their CDM (Roberts et al., 2014; Koposov et al., 2017).

Medical school curriculum

Medical school curricula differ per institution. Therefore, the curriculum of Leiden University Medical Center (LUMC), the Netherlands, is presented, as it is the institution under study in this thesis. The medical study at the LUMC consists of a bachelor and master program of 3 years each. The first 3 years comprise theoretical education. The last 3 years comprise internships, starting in the second year of the master program. After completion of medical school, a doctor may follow medical training to become a GP (three years). During the first year of training, a doctor works in a general practice under supervision of a GP-educator. During the second year, the doctor follows several internships, e.g. in mental health practice. During the third year, the doctor returns to a general practice for their last internship (Leids Universitair Medisch Centrum, 2022).

Traditionally, CDM has been perceived as a purely rational and cognitive process. However, doctors' experienced emotions can and do affect their CDM (Kozlowski et al., 2017). This can be illustrated by GPs' own smoking status and their attitudes towards giving smoking cessation advice, which influence GPs' engagement in smoking cessation of their patients (Stead et al., 2009). Although research is scarce, there are notions that, through emotion, having (lived) experience regarding mental health problems in doctors influence how they detect and treat these problems (Hankir and Zaman, 2013). A recent study found that two in five GPs have experienced conditions such as depression, anxiety, bipolar disorder, and post-traumatic stress disorder (Rimmer, 2018). It is reported in many studies that these conditions develop before doctors-to-be become GPs, namely in medical education, since some aspects of training may have unintended negative effects on the mental and emotional health of doctors-to-be. Some personality traits associated with mental health problems, such as empathy and perfectionism, can be eroded in medical students who are vulnerable to the rigors of medical education (Eley et al., 2016; Eley et al., 2022). Conversely, having a (mental) illness is shown to be a motivation for medical students to start medical school and, in turn, to choose for a particular medical specialty (such as Psychiatry) (Heikkilä et al., 2015; Kerebih et al., 2019). Studies suggest that mental health worsens after students begin medical school and remains poor throughout training (Dyrbye et al., 2005). One explanation for this finding is that medical students struggle to find a balance between training and private life (IsHak et al., 2013). For its impact on GPs' CDM regarding mental health problems in children and youths, it would be clinically relevant to explore mental health problem-related symptoms among doctors-to-be, of whom some will become GPs.

Definitions used in this thesis

Mental health problems are 'health conditions involving changes in emotion, thinking or behaviour (or a combination of these). These problems are associated with impaired functioning in social, school or family activities' (American Psychiatric Association, 2022). There are many definitions of 'psychosocial problems' in the literature, a term mentioned multiple times in this thesis. For clarity, we use the definition 'impairments, activity limitations and participation restrictions related to mood and living, financial and domestic conditions and interpersonal relationships' (Timalsina et al., 2018). As for 'clinical decision-making' we yield the definition 'decisions regarding 1) identification and diagnosis of a child or adolescent with psychosocial problems and/or 2) managing these problems, e.g., referral to outpatient mental health care services or additional psychosocial services' (Simmons et al., 2013; National Library of Medicine, 2022). This thesis also takes into consideration actions followed by doctors' (internal) decision-making, which might influence other professionals' CDM as well. Hence, we alternately yield the term 'way of working', defined as 'an overarching term with which organizations (e.g. general practices) describe how different parts (e.g. GPs and other professionals) work together to achieve optimal results. It describes the desired situation or future state of a transforming organization.' (Gimberg, 2023).

Objective and outline of this thesis

This thesis is constructed of multiple articles, each contributing to answering the main question: ‘how do GPs decide on child and youth mental health problems and what is the influence of their (lived) experience regarding mental health problems on this decision?’ Each article answers a subquestion. Article 1 focuses on ‘how do GPs make decisions regarding psychosocial problems in children and youths?’ by means of a mixed methods design: interviews and an online survey among GPs using a question framework and vignettes representative of mental health problems among children and youths in clinical practice. Article 2 answers the subquestion ‘can GPs’ decisions on child and youth mental health problems be supported by means of a decision-support method?’ It comprises a literature search to retrieve studies that involved clinical decision-support methods (CDSM) for GPs’ CDM regarding mental health problems among children and youths. Article 3 and 4 are directed at the subquestion ‘do doctors-to-be, among whom future GPs, have (lived) experience regarding mental health problems?’ by using self-report questionnaires to measure burnout-, depression- and anxiety-related symptoms and possible correlates among preclinical medical students. Article 4 has a similar study methodology compared to article 3, it studies burnout-related symptoms and possible correlates among medical interns.

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2

Chapter 2 - General practitioners' everyday clinical decision-making on psychosocial problems of children and youth in the Netherlands

(Published in PloS One, 2022)

Abstract

Background

Psychosocial problems in children and youth are common and may negatively impact their lives and the lives of their families. Since general practitioners (GPs) play a crucial role in detecting and intervening in such problems, it is clinically necessary to improve our insight into their clinical decision-making (CDM). The objective of this study was to explore which mechanisms underlie GPs' everyday CDM and their options for management or referral.

Material and methods

This was a mixed methods study in which qualitative (interview substudy) and quantitative (online survey substudy) data were collected from GPs. Using a question framework and vignettes representative of clinical practice, GPs' CDM was explored. GPs were selected by means of an academic research network and purposive sampling. Data collection continued in constant comparison between both substudies. Using grounded theory, data from both substudies were triangulated into a flowchart consisting of mechanisms and management/referral options.

Results

CDM-mechanisms were divided into three groups. GP-related mechanisms were GPs' primary approach of the problem (somatically or psychosocially) and their self-assessed competence to solve the problem based on interest in and knowledge about youth mental health care. Mechanisms related to the child and its social context included GPs' assessment whether there was psychiatric

(co)morbidity, their sense of self-limitedness of the problem and assessed complexity of the problem. Whether GPs' had existing collaboration agreements with youth care providers and how they experienced their collaboration were collaboration-related mechanisms.

Conclusion

The current study contributes to a relatively unexplored research area by revealing GP's in-depth thought processes regarding their CDM. However, existing research in this area supports the identified CDM mechanisms. Future initiatives should focus on validating CDM mechanisms in a larger population. If confirmed, mechanisms could be integrated into GP training and may offer guidelines for regulating proper access to mental health care services.

Introduction

General practitioners (GPs) have an important role in identifying and managing appropriate help for children and youth with psychosocial problems [1]. In the literature, psychosocial problems are broadly described as impairments, activity limitations and participation restrictions related to mood and living, financial and domestic conditions and interpersonal relationships [2]. While psychosocial problems among children and youth are of frequent occurrence in general practice, GPs experience several barriers to their identification and management [1,3]. Barriers relate to the consulting child and its family, to the GP and their methods and to referral to youth care providers [1,4,5]. Children and youth are often reluctant to disclose psychosocial problems, and problems in the abovementioned areas are often preceded by a long patient delay [5]. Furthermore, GPs often feel ill-equipped in their clinical decision-making (CDM) with respect to clinical training, communication skills and spendable consultation time, regardless of their age and work experience [1,4,6]. Last, a lack of referral options due to minimal community-based resources is also much reported by GPs as a barrier to their CDM [5,6].

While the existing literature gives an overview of what can hamper GPs in their detection of and intervention in psychosocial problems in children and youth, it does not provide specific insight into their everyday CDM process [1,4]. This process refers to mechanisms regarding 1) identification and diagnosis of a child or adolescent with psychosocial problems and/or 2) managing these problems, e.g., referral to outpatient mental health care services or additional psychosocial services [5,7,8]. Because of the gap in the literature, further exploring CDM in GPs is of primary importance. Only then we will be able to recognize mental health risk timely and accurately, and thus improve treatment and likely also a child’s future.

Research shows that less than two-thirds of young people with mental health problems and their families access any professional help, suggesting a considerable level of unmet need among children and adolescents [9]. One study reports that just over a third (35.0%) of 4-17 year olds with a mental health disorder had seen a GP [10]. Psychosocial problems that are not identified or treated in time may lead to loss of mental, physical and social-educational well-being in children, possibly continuing into adulthood [11,12]. Additionally, parents may develop feelings of failure, guilt and overburdening while providing care for their child [13].

To avert these consequences, the current study aims to explore the mechanisms for GPs' everyday CDM regarding psychosocial problems in children and youth. Furthermore, this study aims to assist GPs in their CDM and help them balance access to mental health care services (Fig 1 shows a simplified overview of the Dutch youth care system in relation to the social and medical domains concerning a child and its family and/or social network) [14,15]. We explored the options for management or referral that GPs consider in common problem situations, as well as the facilitating and impeding mechanisms that influence their decision-making. To achieve these study goals, we used clinical vignettes. These have been used to measure provider attitudes toward various forms of medical care and are capable of reflecting the relationship between particular patient characteristics and providers' actual CDM [16].

Materials and methods

Study design

In this study, a complementary mixed methods design was used in which both qualitative (interview substudy) and quantitative (online survey substudy) data were collected from GPs working in the study region in order to identify CDM mechanisms. The results followed a convergent design and were analyzed independently and then integrated to develop a conceptual CDM flowchart using triangulation (Fig 2). The study was conducted in accordance with the COREQ checklist (COnsolidated criteria for REporting Qualitative research) [17].

Interview substudy

The interview substudy was conducted from February to June 2017 and comprised 30–45-minutes, one-to-one interviews among 14 GPs in their respective general practices. Interviews were planned 1-2 weeks in advance in consultation with a doctor's assistant. The interviews were semi-structured (i.e., open-ended questions followed by probes and transitions) [18,19], were audio recorded using a voice recorder and were transcribed verbatim by LV. At the start of each interview, GPs were informed about the study's background and aim. Each GP was also asked to sign an informed consent form. For the interview substudy, 176 GPs were contacted by e-mail and telephone, of whom 14 were included.

Online survey substudy

Quantitative data were derived from an online survey conducted in May 2017. The completion time of this questionnaire ranged from 10 to 20 minutes. The survey started with an introductory page including the study's background and aim, as well as a reference to the informed consent form that was attached to e-mails sent to each GP. The online survey consisted of 27 questions based on a question framework. For the online survey substudy, 130 GPs were contacted, of whom 20 responded and 15 filled out the whole questionnaire.

Research group

This study was carried out by a research group consisting of a GP (PB), a child psychologist (AB) who is also a member of a multidisciplinary family support team (youth and family team), a senior researcher in public health (MC) and a medical doctor-researcher (LV). Study-related tasks were divided between the research group members. Vignettes were formulated by PB and AB and approved by LV and MC. LV conducted all interviews alone and did most of the analyses. Weekly research meetings were scheduled with different combinations of the group for reflection on connections and patterns and for LV and other group members to discuss the study's progress. Ideas and hypotheses raised at the meetings were documented using memos.

Ethics declarations

For this study, a medical ethical approval (P17.093) was granted by the medical ethical committee from Leiden University Medical Center (LUMC).

Study setting

Both substudies were conducted in the Holland Rijnland region of the Netherlands which consists of 12 rural and 2 urban districts, each with its own regulations regarding youth mental health care provision. For recruitment, a regional academic research network (ELAN) was used in which 176 regionally established general practices were registered [20]. GPs registered in the research network had previously indicated an interest in scientific research. All GPs who were registered in the network were invited to participate in both the quantitative and qualitative substudy. All registered general practices were sent invitational e-mails with details of the substudies and contact details of the researchers. One reminder was sent for the interview study and three for the online survey.

Participants

GPs who indicated interest in participating in one or both substudies were selected based on purposive sampling [21]. Mandatory sampling criteria included the district in which GPs' general practices were established, with a maximum of one GP per district for the interview substudy. Since there are 14 districts in the Holland Rijnland region, the sample for the interviews initially has been restricted to n=14. If two or more GPs from a particular district indicated their wish to participate in the qualitative substudy, the GP who responded first was included. Another sampling criterion was inclusion of experienced GPs who worked for themselves. Therefore, GPs were selected who would have an overview of youth mental health regulations, in order to gain a full picture of how youth mental health care provision is organized within the study region. In both the quantitative and qualitative substudy, the aim was to include GPs who see psychosocial problems among children and youths a minimum of three times per two weeks. However, during the recruitment, GPs often mentioned a lower frequency of once to thrice a month. We therefore decided to change this criterion and to also include GPs who reported to see these problems in a lower frequency. For the quantitative substudy, only GPs who filled out the whole questionnaire were included. Participation was voluntary. GPs who participated in the interviews received two small presents (a compass and a pen with a LUMC logo) in return for their participation. There was no compensation for participating in the online survey.

Data gathering

Clinical vignettes

In both substudies, three fictional clinical vignettes—A "(suspected) psychiatry," B "multidimensional problems" and C "safety" (Box 1)—were used to explore GPs' everyday CDM. Validation of vignettes was achieved through formulation of the vignettes by a child psychologist (AB) and a general practitioner (PB), based on personal clinical experience regarding referrals of children and youth to a local youth and family center. Also, the vignettes were verbally deemed recognizable with respect to clinical practice during several presentations to GPs and youth mental health workers outside the frame of this study [16,22].

Question framework

For both substudies, the research group developed a question framework to explore CDM and to guide GPs through the clinical vignettes (see Box 2). Unlike the interview study, the online survey included only multiple-choice questions. The question framework included questions on general demographics of the GP (i.e., name, gender, age, years working as a GP, years of working in current general practice), name of district he/she works in, type and frequency of encounters with psychosocial problems in children and youth, frequency of discussing psychosocial problems one on one with a mental health nurse practitioner (MHNP) and self-assessed knowledge of youth mental health care regulations. Questions regarding the clinical vignettes were about the first impression of the problem, thoughts on further diagnostics and management for solving the problem, plan for referral, recognizability of the vignettes with regard to practice, information relevant to achieving a plan for referral (e.g., patients', parents' and siblings' preferences, norms and values regarding treatment) and negative or positive collaboration experiences with other youth care providers (e.g., content, quality and speed of communication). The online survey concluded with three statements on financial cuts to youth mental health care services.

Data analysis

Interview data were analyzed using grounded theory (Fig 2), comparing GPs' CDM between vignettes (within case) and between GPs (cross case). Using constant comparison, respondent validation and triangulation, the essential idea was to develop a single flowchart out of the two substudies in which all codes related to CDM of GPs were grouped into overarching family codes [23]. To find conceptual themes about CDM in the data, LV and PB separately applied codes to the first five interviews using open coding. LV continued this process until all interviews were open coded. During the research group sessions, researchers looked at the relationship between themes of interest by using axial coding and tried to find core themes using selective coding. LV continued these processes individually and reported intermediate findings to the research group members. Particular attention was paid to hypothetical causes and effects of CDM, e.g., GPs' self-perceived knowledge of youth mental health care services and their decision to refer or not refer. For the online survey, descriptive analyses were used to describe the sociodemographic and participant-specific characteristics of GPs and to examine the frequency of multiple-choice answers regarding vignette-guided CDM. Qualitative data were analyzed using ATLAS.ti© version 7.5 [24] and quantitative data using SPSS Statistics© version 24 [25].

Results

General findings

Participants

In total, 29 GPs (15 in the online survey, 14 in the interviews) were recruited, of whom 12 were female (5 in the online survey, 7 in the interviews). Unpurposely, all GPs who participated in the qualitative substudy did not fill out the questionnaire of the quantitative substudy. Therefore, there was no overlap between substudies with regards to participants. GPs had worked an average of 18.6 years (range 5-38 years) and 18.7 years (range 3-33 years) in the field in the online survey and interview study, respectively. Moreover, they worked 15.7 years (range 2-36 years) and 13.0 years (3-32 years) in their current general practice in the online survey and interview study, respectively. Eighteen GPs worked with a mental health nurse practitioner (MHNP) who provides care for children and youth. Nearly all GPs encountered psychosocial problems at least monthly. According to interviewed GPs, vignettes A and C were most recognizable with respect to clinical practice

(Table 1). The online survey did not question recognizability of clinical vignettes.

Organization of mechanisms

Mechanisms for GPs' everyday CDM were organized using a flowchart (see Fig 3). For clarification purposes, mechanisms were subdivided into three domains related to 1) the GP, 2) the child and its social context and 3) GPs' collaboration with other care providers, which are described in detail below. Throughout the results section, identified CDM mechanisms are described following the order of the flowchart. However, the order of CDM mechanisms per GP deviated slightly from the flowchart order (Fig 3). Per CDM mechanism, the supporting results of the online survey are described first, following by the results of the interviews.

Mechanisms related to GP

Preferred approach

To obtain an overview of the child's functioning in different life domains which may have been impeded by the problem situation (e.g., disruptive behavior at home, school, leisure), all but one surveyed GPs would ask for the child's or the adolescent's opinion, as well as the parents' views of the problem situation. Less than half of the surveyed GPs would ask for another care provider's opinion and a youth health care provider's opinion.

Interviewed GPs mentioned contacting abovementioned persons to obtain more information but added that they would use this information to assess whether they attributed the presented problem(s) to somatic or psychosocial origins. A few interviewed GPs expressed their preference to arrange further physical diagnostic tests and, if needed, treatment by the GP themselves or by a somatic care provider, e.g., pediatric neurologist in vignette A. Presumed by the interviewer that physical cause(s) were unlikely or excluded, eventually all interviewed GPs considered psychosocial origins of the problem(s). After considering somatic and psychosocial origins of the problem, all interviewed GPs weighed whether the problem situation would solve itself without intervention or whether an intervention was necessary.

Quote 1B: "Mother has consulted me on her own, but I also think it would be interesting to hear what Sanne has to say."

Quote 12A: "I would like to ask the child neurologist what causes his (Dave) symptoms, is it perhaps epilepsy?''

Competence assessment based on interest in the field

The online survey contained no questions on perceived competence of the GP.

However, the interviews showed GPs' self-assessed competence to manage or refer the presented problem(s) was related to interest in the field on one hand and knowledge about the field on the other hand. A few interviewed GPs explicitly expressed feeling particularly responsible to take up youth-care-related tasks, having experience recognizing or treating psychosocial problems. Other interviewed GPs did not mention anything about felt responsibility. A majority of GPs mentioned that identifying alarming problem situations and coordinating youth-care-related activities were perceived as their tasks, irrespective of their personal interest. Half of the interviewed GPs who explicitly expressed their interest in the field also participated in the district council to discuss recent political developments. A few GPs had previously participated in youth-care-related research. A small minority of GPs had done additional training in this area.

Quote 2A: "My colleague's expertise is cutting and chopping, mine's communication."

Competence assessment based on knowledge about the field

The online survey showed some GPs have knowledge of recent developments in regional and national youth care, initiatives for interdisciplinary collaboration, regional referral options, legal regulations and money flows.

Interviewed GPs who claimed to have knowledge of changes in regional youth care provision stated they were kept well informed by their local authority about these changes. Following from the interviews, knowledge about the field also determined whether GPs first assessed (co)morbid mental health problems instead of choosing immediate referral to a child and youth psychiatrist. One interviewed GP called this immediate referral "my common route." In comparison, other GPs referred based on the specific request for help by the child, its parents or its school. If the GP was constrained by time or not well trained, a MHNP would be consulted to explore this request for help.

Quote 9A: "I know that in this district youth care providers communicate with each other using an information loop."

Mechanisms related to the child and its social context

Sense of self-limitedness

Throughout the vignettes, more than half of all surveyed GPs would advise parents to seek help, i.e., they thought further intervention was necessary.

The interviews revealed that this assessment of whether help or further diagnosis was needed was based on GPs' *gut feeling*. Interviewed GPs answered that this gut feeling was made up of a combination of factors, including: a sense of *something's wrong*, a problem situation not fitting GPs' expectations of a "normal" biopsychosocial development and expected deterioration if the GP refrained from any intervention, i.e., "watchful waiting."

Quote 7C: "Well, I think this behavior is normal for her age."

Assessment of psychiatric (co)morbidity

The online survey contained no specific questions on the assessment of psychiatric (co)morbidity. The interviews, however, showed that GPs assessed whether or not to consult a child and youth psychiatrist based on anamnesis, specific request for help, behavioral observations and previous clinical findings such as family history. However, due to long waiting lists, a few interviewed GPs chose to consult the youth and family team or a self-employed care provider instead, mainly guided by existing collaboration agreements with these youth care providers.

Quote 4C: "It is somewhat unclear here, but Melany could be a troubled teenager with ADD or ADHD. If I would want further psychiatric diagnostic evaluation, I would refer to [name of a local mental health institution], instead of the youth and family center."

Assessment of complexity

The survey showed that in all three vignettes, GPs frequently thought about contacting a local youth and family team or asking their MHNP for further diagnosis and management. For vignette A, some surveyed GPs were also thinking about contacting a specialized mental health professional.

In the interviews, a majority of GPs reported that prior to selecting an intervention for further diagnosis or management, they assessed complexity of the vignettes. GPs spoke of a “complex” problem if the situation combined both multidimensionality and severity. A problem situation was called “multidimensional” if multiple individuals in a family were involved and multiple life domains were impeded. Furthermore, the degree to which a dimension was impeded was described as “severity.” In noncomplex problem situations, most interviewed GPs would ask their mental health nurse practitioner (MHNP) or a self-employed child psychologist to provide short-term treatment or would consult other youth care providers. In more complex cases, GPs would contact a local youth and family team because these teams were considered to offer rapid social support to multiple individuals in a family at the same time. Furthermore, specialized mental health care services would have been chosen in more complex cases. If a consulted care provider would assess the problem(s) to be more or less complex than assessed by the GP, all interviewed GPs were prepared to refer to another youth care provider.

Quote 2B: “I don’t think I have to refer every teenager who lives in a stressful home situation.”

Quote 3B: “The self-employed child psychologist I usually refer to also pays attention to the child’s social system.”

Mechanisms related to collaboration with youth care providers

Existing collaboration agreements

The online survey contained no specific questions on the importance of existing collaboration agreements in GPs’ CDM.

However, the interviews showed that, in cases where GPs thought psychiatric (co)morbidity seemed less likely, they inventoried which youth care provider they already had collaboration agreements with on, for example, consultations, referrals and interdisciplinary meetings. The most frequently mentioned youth care providers to be contacted were MHNPs, self-employed care providers and local youth and family teams.

Quote 5A: "Every six weeks, I speak to our MHNP about patients she has seen."

Quote 14A: "The youth and family team of our district advises us on waiting lists."

Previous collaboration experiences

Surveyed GPs were asked to react to several statements regarding their previous collaboration experiences with youth care providers. Their answers showed a few GPs opining that youth and family teams are suitable for managing social-system-related problems and most GPs opining that budget cuts in youth care services have led to deteriorated quality of care.

The interviews provided more detail with regards to these answers. Almost all interviewed GPs thought recent budget cuts in youth care provision increased the possibility of having negative collaboration experiences rather than positive ones. Negative experiences included poor quality of written or verbal feedback after referral, previous referrals having a negative impact on patient-doctor relationships due to unsafe exchange of private information, patient-perceived stigma after referral, personal unfamiliarity with care provider(s) and low perceived expertise. Negative collaboration experiences with a care provider—local youth and family teams in particular—resulted in referring to another care provider, even if the former provider might have provided more suitable help. Positive experiences made it more likely for GPs to refer to a self-employed care provider they preferred.

*Quote 13A: "After a lot of conversations (with mother of the child, among others), the person from the youth and family team concluded it was a difficult situation. That's a very thorough conclusion after six months. *laughs cynically*"*

Discussion

An online survey and an interview study yielded a flowchart containing mechanisms for GPs' everyday CDM regarding psychosocial problems in children and youth, resulting in a variety of options for management and referral. Identified mechanisms were subdivided into three domains related to 1) the GP, 2) the child and its social context and 3) the GPs' collaboration with other youth care providers. GP-related mechanisms included the preferred approach and perceived competence based on interest in and knowledge about the field. Mechanisms related to the child and its social context included assessed psychiatric (co)morbidity, sense of self-limitedness and assessed complexity of the presented problem(s). Existing collaboration agreements and previous collaboration experiences formed the last domain. With regards to GPs' management and referral when confronted with presented problem(s), consultation options varied between specialized mental health care services, a MHNP, a self-employed care provider, the local youth and family team and follow-up appointments with the GP themselves.

In comparison to the literature, this study contributes to a relatively unexplored research area, by providing data about the in-depth thought processes of GPs regarding their CDM. In line with previous studies, this study shows that psychiatric morbidity is commonly seen in general practice, often co-presenting with problems in other life dimensions [1]. Also, we found that some GPs give more priority than others to somatic instead of psychosocial problems, which may lead to referrals of children with psychiatric (co)morbidity to somatic care providers. This was especially the case with experienced GPs. This finding can be explained by literature reporting current medical training tends to focus on the patient in their social context compared to isolated medical problems [1,4,26]. Corresponding with previous studies, which report that experience, training and attitudes of GPs were key to the correct diagnosis of psychiatric disorders [26], the current study showed that GPs' sufficient perceived interest and knowledge about the field resulted in consideration of more CDM-mechanisms prior to referral instead of an immediate referral to specialized mental health care ('my common route'). However, our findings only refer to GPs' self-perceived competence and do not comprise measurement of actual skills. As for the recently installed youth and family teams at the time of this study, GPs refrained from considering and consulting these teams if they had negative collaboration experiences, even if this choice resulted in poorer quality of care. This finding corresponds with another study in which poor communication, trust and support resulted in perceived patient delay [27]. Our findings underline the importance of interprofessional collaboration as a key factor in initiatives designed to increase the effectiveness of health services offered to the public [28].

This study has several strengths. First, the mixed methods design and usage of vignettes made it possible to examine CDM mechanisms from multiple perspectives and in more detail compared to self-contained interview studies and online surveys [16]. Second, the vignettes were validated in a multidisciplinary research group and were deemed recognizable with respect to clinical practice by GPs, also outside the frame of this study [22]. There are also limitations. First, present study provided some indication for different types of GPs regarding their CDM, as has also been described by Roberts et al 2014, who described the three role archetypes GPs can fulfill while identifying mental health problems in children and youths: ‘fixers’, ‘future planners’ and ‘collaborators’ [1]. However, the sample was not sufficiently large to be able to distinguish divergent types of CDM. Second, there is a possibility of self-selection bias. While characteristics of participating GPs were largely balanced due to use of purposive sampling, no information was retrievable regarding GPs who decided not to participate or who did not respond to the study invitation [29]. Furthermore, GPs who were particularly interested in youth health care might have been included, which may have influenced our results. There was no information retrievable regarding the 5 GPs who stopped filling out the questionnaire after the sociodemographic questions. However, the ones that stopped were not different from the GPs who filled out the whole questionnaire, so the authors think exclusion of these 5 GPs has little to no consequences with regards to our study results regarding GPs’ CDM. Last, some mechanisms were explored to a higher degree in the interview substudy compared to the online survey substudy. Due to a restricted study time schedule, the survey questions were developed during data analysis of the interviews.

The authors suggest that future research is aimed at confirming or disproving the CDM mechanisms found, preferably in settings with multiple general practices. Also, it would be interesting to differentiate between different profiles of GPs based on their CDM in future studies. Since it is important that GPs address psychological problems in children and youth early, investments to improve their clinical practice regarding youth care are necessary, e.g., in medical education. Furthermore, more effective cross-disciplinary work should be encouraged, so that the expertise of multiple care providers can be utilized during GPs’ assessment and decision whether or not to refer

[3,30]. GPs' daily CDM may be interesting to policy makers, so that usage of community-based resources by care providers and families can be well thought out [5]. The abovementioned initiatives should result in providing families with the help they need most.

Conclusions

Participating GPs in a small, mixed methods vignette study showed three domains of CDM mechanisms for the GP, the child and its social context and the GPs' collaboration with other youth care providers. Future initiatives should focus on validating CDM mechanisms in a larger population. If confirmed by quantitative studies, mechanisms could be integrated into GP training and may offer guidelines for regulating proper access to mental health care services.

Acknowledgements

We thank all participating GPs, the research group and everyone who made this study possible. Special thanks go to Ms. E. Wieling, Ms. E. Visser and Ms. A. Stelling for their organizational support.

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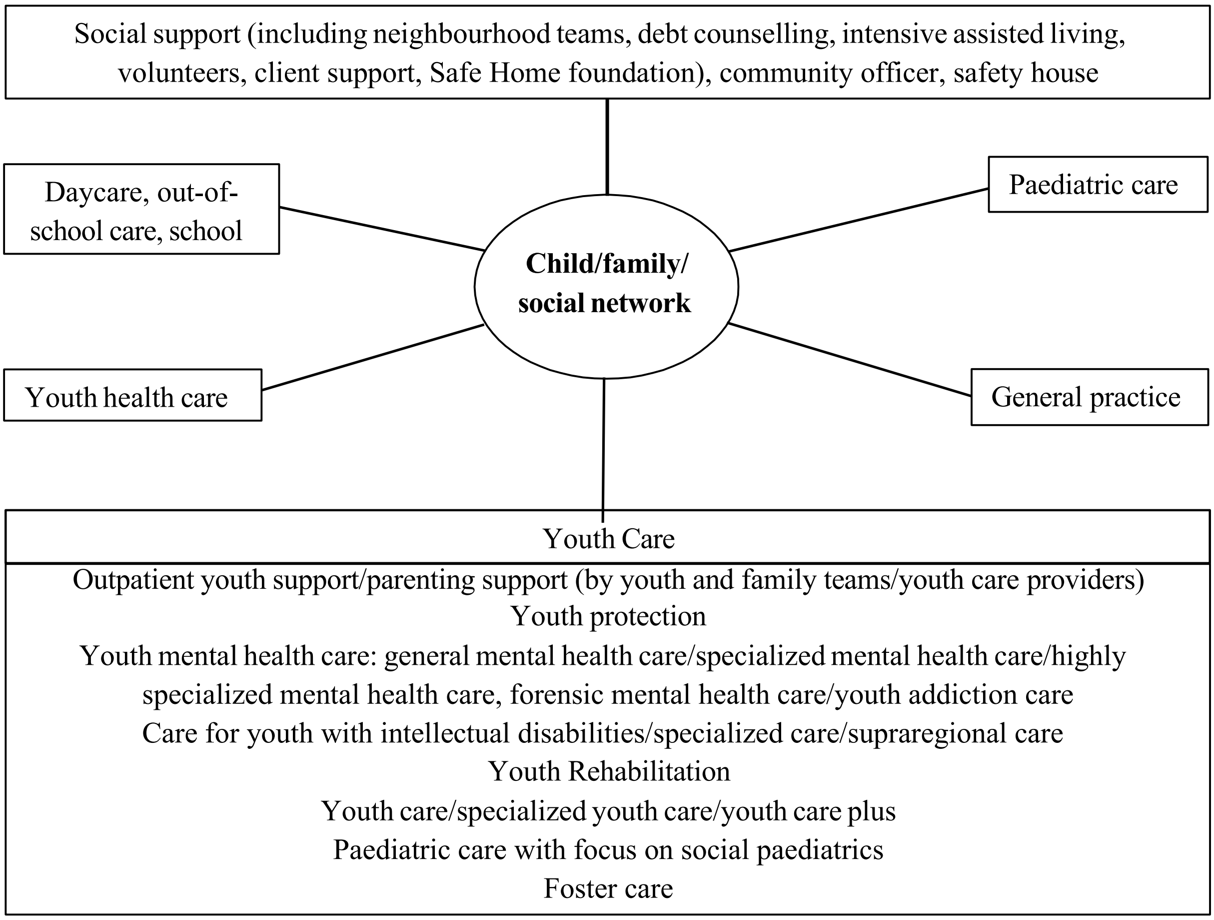
Table 1. Characteristics of GPs – online survey (n=15) and interviews (n=14), N=29

Characteristics	**Online survey**	**Interview study**
Female sex – no. of GPs (%)	5 (33%)	7 (50%)
Number of years working as a GP – no. years	18.6 years (range 5-38)	18.7 years (range 3-33)
Number of years working in current general practice – no. of years	15.7 years (range 2-36)	13.0 years (range 3-32)
Working together with *mental health nurse practitioner* (MHNP) – no. of GPs (%)	15 (100%)	10 (71.4%)
• Yes, MHNP provides care for children and youths	11 (73.3%)	7 (50%)
• No, or GP works together with a MHNP but MHNP does not provide care for children and youths	4 (26.7%)	3 (21.4%)

Frequency of encountering psychosocial problems in children and youths during office hours – no. of GPs (%)		
- Daily encounters (2-3 times a week)	9 (60%)	3 (21.4%)
- Weekly encounters (1 time a week)	2 (13.3%)	4 (28.6%)
- Monthly encounters (1-3 times a month)	4 (26.6%)	6 (42.9%)
- Less than monthly encounters (<1 time a month)	0 (0.0%)	1 (7.1%)
Recognizability of vignettes with respect to clinical practice – number of times mentioned by GPs		
- Vignette A ((suspected) psychiatry)	N/A*	6 times
- Vignette B (multidimensional problems)	N/A	3 times
- Vignette C (safety)	N/A	8 times

*N/A = Not specifically asked

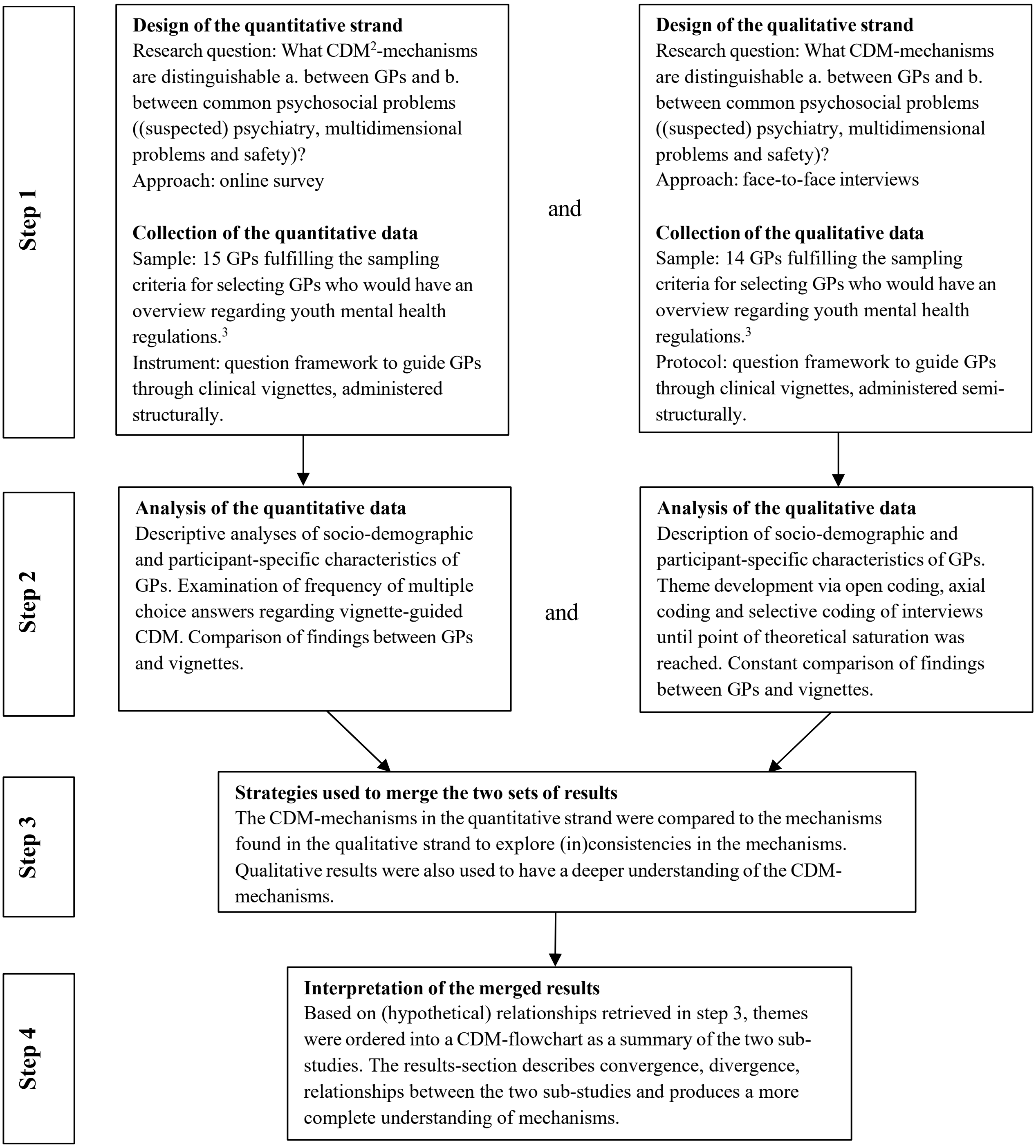
Fig 1. Simplified overview of the Dutch youth care system in relation to the social and medical domains concerning a child and its family and/or social network[1]



Legend

[1] Figure derived from: Akwa GGZ [Internet]. Utrecht; c2022 [cited 2022 Feb 21]. Generieke module Samenwerkingsafspraken (jeugd); [about 9 screens]. Available from: https://www.ggzstandaarden.nl/generieke-modules/landelijke-samenwerkingsafspraken-jeugd-ggz/inleiding/doelstelling-van-deze-standaard (in Dutch).

Fig 2. Methods: Processes related to data acquisition and data analysis (convergent design)[1]



Design of the quantitative strand
Research question: What CDM[2]-mechanisms are distinguishable a. between GPs and b. between common psychosocial problems ((suspected) psychiatry, multidimensional problems and safety)?
Approach: online survey

Collection of the quantitative data
Sample: 15 GPs fulfilling the sampling criteria for selecting GPs who would have an overview regarding youth mental health regulations.[3]
Instrument: question framework to guide GPs through clinical vignettes, administered structurally.

Design of the qualitative strand
Research question: What CDM-mechanisms are distinguishable a. between GPs and b. between common psychosocial problems ((suspected) psychiatry, multidimensional problems and safety)?
Approach: face-to-face interviews

Collection of the qualitative data
Sample: 14 GPs fulfilling the sampling criteria for selecting GPs who would have an overview regarding youth mental health regulations.[3]
Protocol: question framework to guide GPs through clinical vignettes, administered semi-structurally.

Analysis of the quantitative data
Descriptive analyses of socio-demographic and participant-specific characteristics of GPs. Examination of frequency of multiple choice answers regarding vignette-guided CDM. Comparison of findings between GPs and vignettes.

Analysis of the qualitative data
Description of socio-demographic and participant-specific characteristics of GPs. Theme development via open coding, axial coding and selective coding of interviews until point of theoretical saturation was reached. Constant comparison of findings between GPs and vignettes.

Strategies used to merge the two sets of results
The CDM-mechanisms in the quantitative strand were compared to the mechanisms found in the qualitative strand to explore (in)consistencies in the mechanisms. Qualitative results were also used to have a deeper understanding of the CDM-mechanisms.

Interpretation of the merged results
Based on (hypothetical) relationships retrieved in step 3, themes were ordered into a CDM-flowchart as a summary of the two sub-studies. The results-section describes convergence, divergence, relationships between the two sub-studies and produces a more complete understanding of mechanisms.

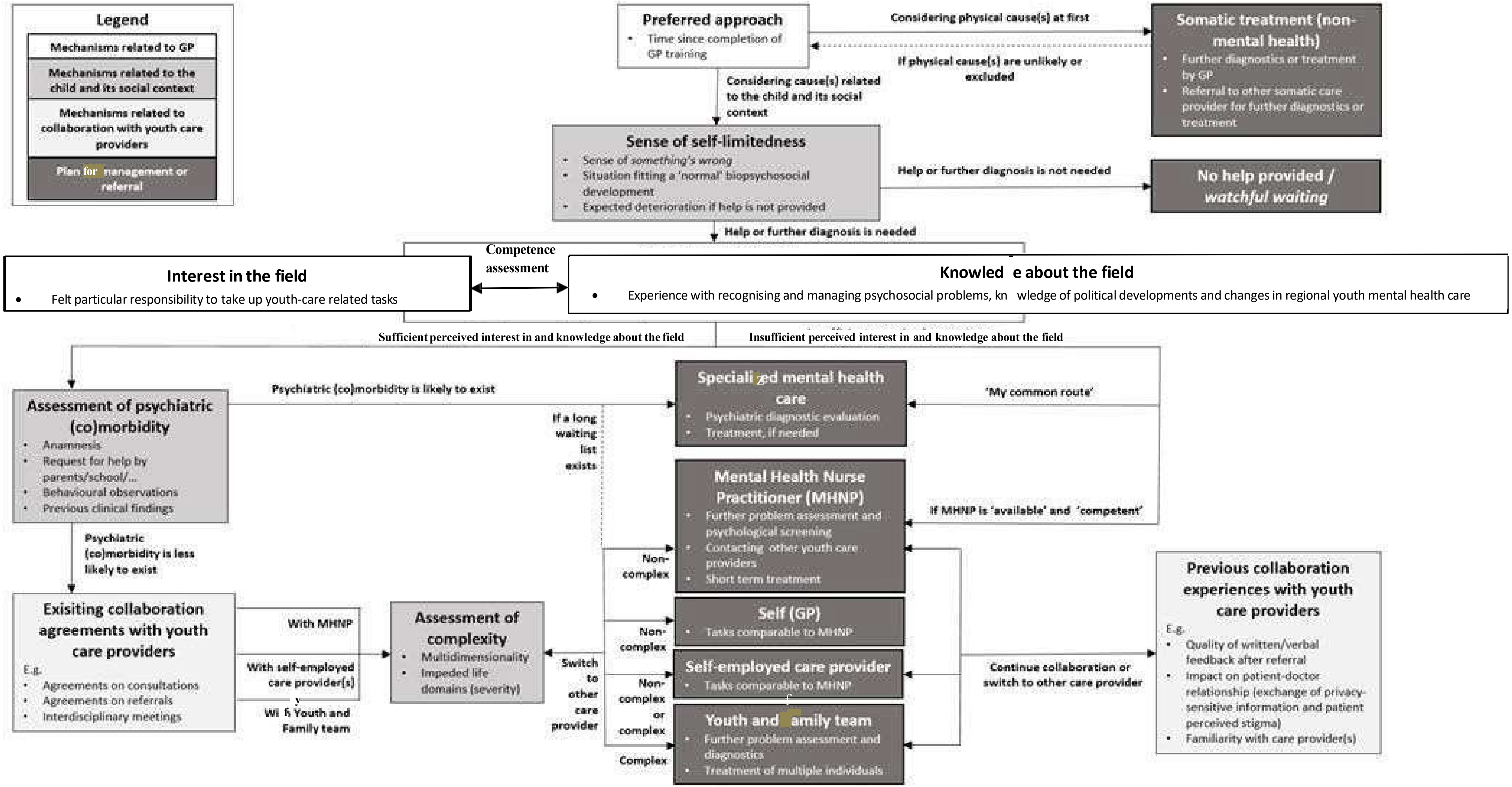
Legend

[1] Figure derived from: Creswell JW, Plano Clark VL. Choosing a mixed methods design. In: Creswell JW, Plano Clark VL, editors. Designing and conducting mixed methods research. Thousand Oaks: SAGE Publications Ltd; 2017. p. 53-106.

[2] CDM = Clinical Decision-Making

[3] Sampling criteria included district in which GPs' general practices were established (with a maximum of one GP per district for the interview sub-study), GPs who reported seeing psychosocial problems among children and youth a minimum of three times per two weeks and experienced GPs who worked for themselves.

Fig 3. Flowchart of mechanisms related to GPs' everyday clinical decision-making when encountering psychosocial problems in children and youths[1,2]



Legend

[1] Presented flowchart shows GPs' sequence of reflections and decisions when confronted with psychosocial problems in children and youths during office hours.

[2] Boxes show in-depth considerations related to a specific mechanism.

Box 1. Vignettes - A '(suspected) psychiatry', B 'multidimensional problems' and C 'safety'

Vignette A '(suspected) psychiatry' (Dave, 6 years old)

1. *Mother visits the GP, together with Dave*

School has advised mother to talk to her GP about Dave. School is wondering whether Dave has autism or ADHD because of concentration problems, difficulties in dealing with frustrations and bad moods in situations where Dave does not get his way.

2. *(some time later) – Dave's mother and father visits the GP, without Dave*

Dave's behaviour at school has been problematic since the beginning of second grade. He often refuses to do his work and his behaviour annoys his classmates. Dave is easily distracted. He also looks for distractions during work activities. However, at home, he finishes his homework in a couple of minutes. Currently Dave is undergoing a clinical examination by a paediatric neurologist because he is thought to have epileptic attacks. Dave's parents ask their GP what could be causing their son's behaviour ('ADHD?') and how they should handle his upbringing. The GP discovers that a local youth and family team is already involved, without his knowledge. Dave's parents want to ask the neurologist whether their son's bedwetting is 'normal' or 'abnormal' at his age.

At home, during dinner, the parents often notice that they have to call Dave back to the table. He often refuses to tidy up. When Dave is away from home, he doesn't show any problematic behaviour. Therefore, father thinks that his son's ears are fine. Dave has an inquisitive nature and there are many subjects he would like to know more about. For example, he is looking forward to conversations with the GP. Mother has a family history of ADHD. Mother's brothers have been diagnosed with motor control deficits. Dave's parents want to know what's wrong with Dave and how to cope with his behaviour.

3. *(some time later) Dave's mother visits the GP, together with Dave*

The situation at school is deteriorating. Dave's mother is very concerned. She is talking to a special education generalist at school, who is affiliated to the local youth and family team. Diagnostic questionnaires have been conducted to explore the symptoms of his concentration problems, social difficulties and autistic behaviour.

Vignette B - 'multidimensional problems' (Sanne, 14 years old)

1. *Sanne's mother visits the GP, alone*

Sanne, a girl with below-average intelligence, attends training college. She frequently has temper tantrums at home when she doesn't get her way. She is the oldest of five children. Her youngest sister is 1.5 years old. Her younger brother also has below-average intelligence. Sanne's other brother and sister are tired of all her tantrums.

2. *(some time later) Sanne's mother visits the GP, together with Sanne*

Sanne's mother has physical issues ('osteopenia') and is therefore not able to work. She is angry with school because they aren't keeping the promises they made: Sanne doesn't have to attend gym class because of her painful knees. Sanne often refuses to go to school because of bellyaches. She is also being bullied by her classmates.

Sanne shows very structured behaviour at home. She always puts her things on the same places and gets angry if people move them. She has set times for her morning ritual. If things go differently, she immediately thinks she will be too late for school. Sanne has difficulties falling asleep at night because of restlessness.

Sanne's father works full-time and her mother has the responsibility for a large part of the childrens' upbringing. Sanne's mother and father often disagree with each other when it comes to raising their children. Sanne's father is less patient with Sanne's moods.

3. *(some time later) Sanne's mother visits the GP, together with Sanne*
Sanne's family is cramped for space. Her parents have financial problems but no debts. Sanne is expected to run the household and to take care of her sisters' upbringing, which she enjoys. Sanne's mother is not able to do this herself because of her painful hands. Sanne's mother complains that school makes a big deal out of Sanne's help in the household. She says that school is threatening to inform the GP about Sanne's situation.

Vignette C - 'safety' (Melany, 15 years old)
1. *Melany's mother visits the GP, alone*
Melany's mother describes her daughter's behaviour, which is causing tension at home. Melany won't follow the rules and her performance at school is poor. Melany frequently drinks alcohol at a place called 'the Shed'. She often comes home too late.

2. *(some time later) Melany's mother visits the GP, without Melany*
Melany's parents got divorced 7 years ago. Melany lives with her father part of the week and with her mother the other part. Melany's mother has a new partner. They are not living together. Melany and her father often have conflicts. When Melany misbehaves, her father gets very angry. Melany's mother doesn't want to talk about these conflicts, because father's angry moods were one of the reasons for their divorce. School feels that Melany's parents are giving their daughter too much freedom and too little support in her homework. Melany doesn't want to be controlled by her parents while doing her homework. She says that she only studies if it's really necessary.

3. *(some time later) Both parents visit the GP, with Melany*
Melany is having difficulties finding rest. She is always contacting her classmates on her phone. She feels depressed regularly and worries a lot. She cannot come up with things she is good at or things that her parents are proud of. She isn't motivated to study and doesn't even know why she does any work. She often forgets to do her homework. However, when she does study, she gets good grades. She often gets angry at teachers who treat her unjustly. Some people say she doesn't have any feelings.

Box 2. Interview guide

Interviews

General questions

1a. Name?
 b. Age?
2a. Number of years working as a GP?
 b. Number of years working in current general practice?
3. Frequency of encountering psychosocial problems in children and youths during office hours?
4. What do you know about…

- …the Youth Care Act (2015)?
- …local youth and family teams?
- …regional specialized child mental health care?

Questions regarding vignettes

1. What did you think when you read this vignette?

- First impression?
- What do you think is the problem here?
  - ○ What else do you need to investigate in this problem (e.g. anamnesis? diagnostic tests?)
  - ○ Did you make a diagnosis? If so, what was your diagnosis? Why?
- Do you recognise this vignette from your own clinical practice?
  - ○ If so, what did you think back then? How did you explore the problem?
- What is your plan for management or referral?
  - ○ What do you need in order to come up with a plan for management or referral (e.g. anamnesis? diagnostic tests?)
  - ○ What plan would you usually follow when you encounter such cases?

2. How did you come up with this plan for management or referral?

- To what extent would the following information influence your plan for management or referral?
  - ○ child's/parents'/sisters' or brothers'/school's/... preferences?
  - ○ child's/parents'/sisters' or brothers'/school's/... norms and values?
  - ○ feasibility of the plan for the child/parents/… (e.g. treatment compliance)
  - ○ conflicting opinions child vs. parents, child/parents vs. GP?
  - ○ biomedical factors: medical history, (psycho)medication
  - ○ social factors: illness behaviour, request for help, advice given by others, dependency on social environment, loss of social contacts, loss of privacy
  - ○ psychological factors: child's own ideas on the problem, knowledge, behaviour, (mental) handicaps
  - ○ social economic status

3. If you chose to ‘solve’ the problem yourself:
    - why do you want to try to solve the problem yourself?
    - how are you planning to solve the problem?
    - when would you decide to refer the child to another youth care provider?

4. If you chose to refer the child:
    - why did you refer the child?
    - to which youth care provider did you refer it to
        - ○ youth care physician?
        - ○ paediatrician?
        - ○ youth and family team?
        - ○ specialized child mental health care (child- and youth psychiatrist)
        - ○ mental health nurse practitioner (MHNP)
        - ○ other youth care provider?
    - how are you planning to refer this child (e.g. using internet, by telephone)
    - why did you refer to this youth care provider in particular
        - ○ rational reasons?
        - ○ (social)emotional reasons?
        - ○ previous collaboration experiences with this youth care provider?
    - current collaboration experiences with this youth care provider:
        - ○ what processes run smoothly (e.g. speed of communication, quality of written feedback?)
        - ○ which points could be improved (e.g. communication)?

Additional questions

1. What is your definition of ‘collaboration’ (consulting/referring/physical meetings/…?)
2. What is your definition of youth mental health care, youth and family teams, …?
3. Do you consider psychosocial problems in children and youths to be mainly a problem of the individual or a problem of the child’s social system?

Chapter 3 - Clinical decision support methods for children and youths with mental health disorders in primary care

(Published in Family Practice, 2022)

Abstract

Background

Mental health disorders among children and youths are common and often have negative consequences for children, youths and families if unrecognized and untreated. With the goal of early recognition, primary care physicians (PCPs) play a significant role in the detection and referral of mental disorders. However, PCPs report several barriers related to confidence, knowledge, and interdisciplinary collaboration. Therefore, initiatives have been taken to assist PCPs in their clinical decision-making through clinical decision support methods (CDSMs).

Objectives

This review aimed to identify CDSMs in the literature and describe their functionalities and quality.

Methods

In this review, a search strategy was performed to access all available studies in PubMed, PsychINFO, Embase, Web Of Science, and COCHRANE using keywords. Studies that involved CDSMs for PCP clinical decision-making regarding psychosocial or psychiatric problems among children and youths (0–24 years old) were included. The search was conducted according to PRISMA-Protocols.

Results

Of 1294 studies identified, 25 were eligible for inclusion and varied in quality. Eighteen CDSMs were described. Fourteen studies described computer-based methods with decision support, focusing on self-help, probable diagnosis, and treatment suggestions. Nine studies described tele-communication methods, which offered support through interdisciplinary (video) calls. Two studies described CDSMs with a combination of components related to the two CDSM categories.

Conclusion

Easy-to-use CDSMs of good quality are valuable for advising PCPs on the detection and referral of children and youths with mental health disorders. However, valid multicenter research on a

combination of computer-based methods and tele-communication is still needed.

Lay summary

Mental health problems among children and youths are common and have impacts, not only on the person affected but also on families and communities. They are often not recognized and acted upon by primary care providers (PCPs), such as general practitioners. This may be due to a lack of confidence in talking to young people or insufficient knowledge about mental health problems. PCPs make decisions about managing or referring these problems to mental health specialists, which can be assisted through clinical decision support methods (CDSM). CDSMs can be divided into electronic and non-electronic. This study provided an overview of both types of CDSMs. We focused on the capabilities of CDSMs and how they help PCPs in their decision-making. More than half of the reviewed CDSMs were electronic CDSMs; several CDSMs involved tele-communication between PCPs and mental health specialists. Two of the CDSMs comprised a combination of components of both types of CDSMs. CDSMs offered patients more information about their health while providing PCPs with suggestions for their decision-making.

Background

Mental health disorders among children and youths are common, as an estimated 10–20% of them experience mental health difficulties (1, 2). All too often, mental health disorders remain underdiagnosed and undertreated (3). A continued disparity exists between the increasing demands for pediatric mental health services and the limited supply of these services, particularly because of a shortage of child and adolescent psychologists and psychiatrists (4-7). To prevent negative long-term consequences for families and economic burdens for communities, accurate and timely detection of mental health disorders and appropriate referrals to youth mental health care are essential (8, 9). One in four 7–12 year olds and four in ten 13–16 year olds who attend primary care have some sort of mental health problem (10). Therefore, primary care providers (PCPs) play an important role in the detection of mental health disorders and referrals to specialist services (10). In most Western countries, general practitioners (GPs) and pediatricians are examples of PCPs (11). Despite their crucial role, PCPs report a profound lack of communication skills with children and adolescents and a lack of confidence and knowledge about mental health difficulties, which negatively affect their clinical decision-making (8, 9, 12). Furthermore, collaborative care between PCPs and specialist child and youth mental health care providers is not satisfactory in terms of interdisciplinary communication and logistic procedures, for example, the quality of provided patient-specific information in referral letters (9).

To improve detection of mental health disorders and referral efficacy, various approaches have been developed to support PCPs in their clinical decision-making, including clinical decision support methods (CDSMs) (8). Currently, no universal definition of CDSM exists. Therefore, this study uses the CDSM definition by Sim et al. (2001): ‘methods that are designed to be a direct aid to clinical decision-making, in which the characteristics of an individual patient are matched to a (computerized) clinical knowledge base and patient-specific assessments or recommendations are then presented to the clinician or the patient for a decision’ (13). Overall, CDSMs are aimed at the clinician analyzing the current condition of the patient and providing support regarding treatment or referral, whereas decision aids are aimed at patients, offering choices regarding medical treatment. However, similar to decision aids, some CDSMs may encourage patients to participate actively in healthcare decisions (14).

There are remarkable differences between non-computer-based and computer-based CDSMs, although previous research has mainly focused on computer-based CDSMs. One systematic review concluded that there is a need for readily available systems that promote evidence-based practices. These systems should consider regional variations in practice. They should leverage data reuse to generate predictions regarding treatment outcomes and address a broader cluster of clinical disorders. Furthermore, these systems should target primary care practices with limited knowledge and skills regarding child and adolescent psychiatry (8). Research on non-computer-based CDSMs, such as child psychiatry access programs, recommended more investigations on the broad impact of these programs on, for example, patients, families, or health systems instead of more descriptive evaluations focusing on program usage and provider satisfaction (15).

The present systematic review aimed to identify CDSMs for primary care that support clinical decision-making regarding children and youths with mental health disorders. To this end, a distinction was made between non-computer-based and computer-based CDSMs. The objective of this review was to describe the functionalities of CDSMs and their capability to provide diagnostic and referral support. Furthermore, we assessed the content of CDSMs and the quality of the underlying studies.

Methods

Search strategy

To identify all available studies, published between 2009-2021, that have described CDSMs for mental health disorders in children and youths in primary care, PubMed, PsychINFO, Embase, Web Of Science and COCHRANE were searched in August 2021. A combination of the following keywords was used in the search strategy: ‘Efficacy’, ‘clinical decision-making’, ‘support’, ‘triage methods’, ‘general practitioner’, ‘psychiatry’, ‘mental health disorders’, ‘child’, ‘adolescent’, ‘primary care’ and ‘secondary care’. By consensus, LV, VR, and an information expert specifically selected each keyword and potential synonym. Questions related to keyword selection were discussed with MC. The detailed search strategy is described in the Supplementary Material.

Inclusion and exclusion criteria

Inclusion and exclusion criteria were determined prior to the keyword search. Peer-reviewed studies that described CDSMs for mental health disorders among children and youths (0 to 24 years) were included. By 'CDSM,' the authors mean a method (a procedure, e.g., digital support) that assists PCPs in assessing children and youth with mental health symptoms and in deciding the need for referrals to specialized mental health care, preventive care, or primary care support. The search was limited to publications in English and Dutch. Studies were excluded if the recruited participants were all aged 25 years or older and if the methods used fully consisted of a dichotomous screening instrument (16).

Selection procedure

Titles and abstracts from all identified studies were reviewed by LV and VR based on inclusion eligibility. Based on the inclusion and exclusion criteria described above, titles and abstracts were categorized into 'to include,' 'questionable,' and 'to exclude.' Questions raised with regard to studies labeled as 'questionable' were discussed with MC prior to being labeled as 'to include' or 'to exclude.' For example, there was a discussion about whether some studies fulfilled the criteria for CDSM; that is, the method was more focused on the assessment of mental health problems instead of supporting the decision regarding follow-up care. Full-text studies labeled as 'to include' were read by LV and VR while extracting information as described below. Figure 1 describes a detailed flow-chart concerning the inclusion and exclusion process. The systematic review was conducted in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses Protocols (PRISMA-Protocols) (17).

Variables extracted

Based on study methodology as mentioned in previous research., categories of information to be extracted were assembled by LV, VR, and MC by reaching a consensus (8). No efforts were made to synthesize outcomes because of the variability of the results presented by the studies reviewed. Extracted variables regarding the content of the CDSM were (abbreviated) method name, target population, targeted professionals, goal, content and organization of the method, and phase(s) of clinical decision-making that are supported by the CDSM: diagnosis, assessment of severity, and management (18). We also extracted variables regarding study design: objectives, methods, outcomes on provider (e.g., user satisfaction), patient level (e.g., referral efficacy), measurement moments and study duration, name of intervention, control group characteristics, target group characteristics, number of study participants, gender ratios, and mean ages of patients, as well as results at the provider and patient levels. The quality of the included studies was appraised by LV and VR using the Crowe Critical Appraisal Tool (CCAT), which helps in rating the studies included in a systematic review (19). CCAT helps readers with different levels and types of knowledge to reach similar conclusions about a research paper. The CCAT is one of the few instruments that has undergone both reliability and validity evaluations and is able to appraise different research study designs. The tool has been used broadly in previous research (19-22). The CCAT consists of a 22-item form divided into eight categories—preliminaries, introduction, design, sampling, data collection, ethical matters, results, and discussion of a study—which are scored by readers on a 6-point scale from 0–5. Each study is assigned a score on these categories, and the total score is obtained as a sum of all category scores (ranging from 0 to 40) (23). LV scored all included studies before reaching agreement on scores with VR.

Results

After removal of duplicates, the search strategy yielded 1294 studies across different databases. Some studies were excluded based on eligibility of titles and abstracts. Another set of studies was excluded because they met the exclusion criteria based on reading their full texts. Lastly, we added studies found in the reference lists of some of the included studies. In total, 25 studies describing 18 different CDSMs were included in the review (Figure 1). All studies were written in English or Dutch.

Computer-based decision-support methods (CBDSM)

Of all identified CDSMs, more than half were computer-based decision-support methods (CBDSM) directed at patients 0–75 years old. CBDSMs provided electronic support on (clinical) reasoning for patients and providers (24-37). For patients, these methods provide tools for assessing (future) symptom severity (34-37) and consecutive self-management of their mental health (33). The methods were also used to integrate service users' and practitioners' expertise about mental health to allow shared decision-making (24). Providers were given probability diagnoses following evidence-based algorithms based on routine data (27) and surveys (28, 29, 31, 34-37). Furthermore, some methods offered providers treatment suggestions (24, 25), such as medication management (26, 32) and referral support (25, 35, 36). To achieve this output from the system, specific patient- and provider-related input was necessary. Patient-related input included vital signs and laboratory test results (e.g., body mass index, systolic and diastolic blood pressures, blood lipids, glucose metabolism), as well as questions on a variety of mental health areas (e.g., symptoms, side effects, treatment preferences, adherence, and response) (24, 32, 34-37). Non-medical information, such as social life, finances, and school performance, was also retrieved in some methods (24, 28-31). Provider-related input comprised information in the child's electronic health record (34), health risk questions based on this information, and screening questions following a decision tree (27-31). Most computer-based methods focused on a variety of diagnoses (24, 27-29, 31, 35-37). However, some focused on one specific disorder or symptom, such as autism spectrum disorder (25, 30, 34), attention-deficit/hyperactivity disorder (ADHD) (26), and psychosis (33). More than half of the CBDSMs supported all phases of clinical decision-making, that is, support of diagnostics, assessment of severity, and management (25, 26, 28-31, 34-37). Other methods supported two phases, that is diagnostics and assessment of severity (24, 33) or diagnostics and management (27, 32) (Table 1).

Observational (24, 25, 27-29, 37), comparative (26, 29, 32, 33, 34-36), or validation study designs (30, 31) were used to study the implementation (including clinical and cost effectiveness) or the validation of the CBDSMs. The observational studies found that the CBDSMs were generally appreciated by both patients and care providers, for example, regarding a shared understanding of mental health risks, which facilitated implementation into primary practice (24, 27, 37). However, barriers related to workflow were also reported, such as challenging and confusing access to the method, hardware- and software-related difficulties, the need for duplication during the transition from paper to the electronic system, and issues regarding computer literacy (24, 25, 27). The comparative studies showed a reduction in psychological distress compared to usual care (35, 36) and an increase in the rate of diagnostic assessments compared to (community) control samples, which resulted in, for example, more prescriptions and visits (26, 28, 32, 34). Furthermore, these studies showed a higher quality of care with respect to ADHD diagnosis (26). The studies reported fewer or no side effects (35, 36) and a reduced weight gain when patients used medication (32). In one study, the use of the CDSM led to an increased PCP understanding of patient mental health compared to an attention-comparison group, in which daily activities were monitored without monitoring mood and stress (33). All validation studies were directed at the Development and Well-Being Assessment (DAWBA). This method showed good test capabilities when compared between groups of low to high risk of autism spectrum disorder or eating disorders, with high sensitivity (88–100%), specificity (85–94%), positive predictive (82–88%), and negative predictive values (90–100%) (30, 31) (Table 2). The average study quality of the CBDSMs was three stars (total score of 30.61), according to the CCAT (24-37). Lower total scores were attributed to poor description of design and sample of the study, whereas higher scores were attributed to a clear description of the data, as well as results and discussion sections (24-37) (Table 3).

Tele-communication methods

Less than half of the identified CDSMs were tele-communication methods targeted at 0–21 year olds. The tele-communication methods consisted of a practice in which PCPs are advised on mental health management through (video) conferences between psychiatrists and patients (38-46). These methods offered patients psychoeducation on medication (45), illness and diagnostic issues, exercise and lifestyle issues (43), and providers recommendations on referral (39, 46). Some tele-communication methods also offered (peer) training for PCPs as part of the method (38-40, 45, 46), face-to-face assessments for patients if necessary (39, 43), and strategies for practice transformation to integrate the tele-communication method (45). All but one method (42) focused on multiple mental disorders at once (38-41, 43-46). In one tele-communication method, there was no contact between psychiatrists and patients, but physicians received advice from psychiatrists on starting dosages of medication based on effect rating scales (42). Almost all tele-communication methods supported all phases of clinical decision-making (38-41, 43-46); one method supported two phases, that is, assessment of severity and management (42) (Table 1).

To investigate the tele-communication methods, almost all the studies used an observational design (38, 39, 43-46). One study used a comparative design (42). The studies showed behavioral improvement of the child compared with a sample of children not participating in the CDSM (42), provider's and patient's satisfaction with the method (44), PCPs' knowledge and confidence regarding mental health disorders (38, 39, 43, 46), and collaborative treatment between PCP and family (39) after implementation of the method. Furthermore, the studies reported alleviation of the gap between youth needing quality behavioral health services and those receiving them (45), improved mental health in a convenience sample over time (41), more psychotropic medication prescriptions compared to a group of PCPs not receiving training for the CDSM (40), and increased psychotherapy, medical behavioral health visits, and guideline congruent medications prescriptions (45) (Table 2). The average CCAT score for the tele-communication methods was two stars (total score of 26.20), with lower scores mainly attributed to description of design and used data, and higher scores attributed to description of results and discussion (38-46) (Table 3).

Combination of CDSMs

Two identified CDSMs were CDSMs consisting of a combination of computer-based decision-support- and tele-communication method-related components. These CDSMs were directed at patients between 16 months of age and patients older than 75 years (47, 48). One CDSM started with an algorithm in the patient's electronic health record, which decided whether the patient health questionnaires were completed (47). If the questionnaires indicated that the patient needed to be referred based on depression symptoms, there was an option for the PCP to have contact with a child and youth mental health care provider on medication prescriptions (47). The other CDSM comprised a screening instrument via the patient's electronic health record, with the possibility of referring the patient to a multidisciplinary team for autism evaluation as part of the method (48). Both CDSMs were directed at one specific disorder (47, 48). The CDSM described by Thompson (2019) supported all phases of clinical decision-making (47). The CDSM described by Campbell (2021) supported two phases: diagnostics and management (48). Thompson's (2019) study used a comparative design with which the effectiveness of screening, referrals, and treatment uptake were measured via analysis of electronic health record data and screening of patients using the Patient Health Questionnaire 2 and 9 (47). The study by Campbell (2021) consisted of a comparative design that implemented process changes in intervention clinics (48). Comparisons were made between these intervention clinics and community clinics (which only received automatic reminders as part of the process changes), as well as between phases of change (48). Both studies showed an increase in screening and referral rates (47, 48). The average quality of Thompson (2019) and Campbell (2021) was one and two stars (total score of 24.76), respectively, with lower scores attributed to poor descriptions of ethics and higher scores attributed to well-described introduction sections (47, 48) (Table 3).

Discussion

The present literature review aimed to provide a description of the functionalities of CDSMs and their capability to provide diagnostic support and support for management or referral by primary care practitioners (PCP). Furthermore, we examined the content of CDSMs and quality of underlying studies. This review yielded 25 studies describing 18 CDSMs used in primary care.

The majority of the CDSMs were CBDSMs, which provide electronic support on clinical reasoning following an algorithm. These CDSMs assist patients by offering tools for assessing the severity of (future) symptoms and consecutive self-management of their mental health. Moreover, they assist PCPs by offering probability diagnoses and suggestions for further management or referrals. Some functionalities of this category of CDSMs include monitoring tools (33, 37), screening forms (25, 26, 34, 37), a patient registry, a patient encounter scheduler, trial management (27) and (self-)assessment instruments (24, 27, 35, 36) with structured or open-ended questions (28-31). The CBDSMs are directed toward mental health disorders and provide PCPs with advice on diagnosis based on data collected before the consultation.

Less than half of the identified CDSMs were tele-communication methods. Through video conferences between psychiatrists and patients, these methods offer patients psychoeducation on multiple mental health topics. Additionally, these methods advise PCPs on mental health management or referrals. Contrary to CBDSMs, tele-communication methods are used to generate advice on diagnosis and referral based on concerns of the PCP during the consultation. Their functionalities comprise education for PCPs to improve detection of mental health disorders (38-40, 42, 45), referral support by phone, e-mail and/or video (41, 42, 44-46), and face-to-face evaluations with patients if necessary (38-40, 43, 46). We found two CDSMs that consisted of a combination of CBDSM- and tele-communication method-related components (47, 48).

There are several pros and cons of the identified CDSMs with regard to their usability in the primary care process as well as their relevance for clinical practice. CBDSMs provide the PCP with more information about possible mental health disorders based on electronic health records (34) and, if applicable, a previous consultation, information that can be used to structure the next consultation with the child (32). For some CBDSMs, this notice is based on data from large studies (28). Moreover, children and their parents can have the opportunity to prepare for the consultation, because the CBDSMs stimulates them to think about relevant medical information that may also be discussed with their PCP (32). Another advantage is that no other care providers are involved in using the CDSM, except for the PCP (25). Therefore, the invested time and costs are limited. There are also disadvantages. First, CBDSMs should not be used in urgent situations because input from children and their parents may be quite time-consuming (30). Second, for some patients, computer-based decision support may be difficult to use due to their mental status (32). Third, a set of questions received beforehand may give too much direction to the consultation, which may impede children and their parents from talking about one set of problems more than others (35, 36).

An advantage of tele-communication methods over CBDSMs is their usability during consultation with the child. Therefore, information gathered during the conversation can be used directly for the tele-communication method (41). Furthermore, tele-communication methods provide room to take the context of the child and its problem into account while generating advice on diagnosis and referral, information that might be missed when using predetermined questions (44). A disadvantage of tele- communication methods is that their usage requires time investment from both PCPs and mental health care providers, which also makes them more costly compared to the one-off purchase of CBDSMs (39). CDSMs that consist of CBDSM- and tele-communication method-related components may have a combination of the abovementioned advantages and disadvantages (47, 48).

CBDSMs were directed at 0–75 year olds, tele-communication methods at 0–21 year olds, and a combination of these CDSMs at 16 months old, as well as patients older than 75 years. Since this is a broad age range, it should be noted that the applicability of individual CDSMs differs by age category. For example, younger children should be assisted by their parent and/or caregiver while providing information for a CDSM. By contrast, adolescents may be capable of providing information without any help, depending on their age and capability of self-determination (28-31). Therefore, PCPs should be aware of national care regulations with regard to the self-determination of young people (49).

The quality of the underlying studies of CDSMs was variable. Compared to studies describing tele-communication methods, studies describing CBDSMs had a higher quality, that is, with regard to description of the data. The aims of the studies describing CBDSMs were to describe the functional capabilities of the CDSM (27), to validate the CDSM (28, 30, 31), to describe PCP user satisfaction regarding the CDSM (24, 33, 37), to compare care with the CDSM and care without the CDSM with respect to screening rates (34) and cost-effectiveness (35, 36). Furthermore, these studies assessed the impact of the CDSM on the patient's view of their own life and health (24, 32) and explored the effect of using a CDSM on PCP's knowledge, beliefs, and self-reported practice regarding mental health disorders (25). The aims of studies on tele-communication methods included a description of the impact of CDSMs on care (e.g., medication prescriptions, treatment plans) (33, 40, 42) and costs (45), effectiveness of detection of mental health disorders (39), PCP-reported satisfaction with the CDSM, and PCP's knowledge and confidence regarding mental health disorders (38, 39, 44-46). It is notable that almost all the studies on tele-communication had an observational study design, implying a need for more comparative research designs (38 39, 43-46). Studies describing CDSMs consisting of a combination of both CDSM types were of low average quality. These studies aimed to analyze the effectiveness of screening, referrals, and treatment uptake of the CDSM, as well as to assess quality improvement related to screening and referrals while implementing process changes (47, 48).

There were a few studies with outcomes specifically directed at ensuring accurate and timely detection of mental health disorders and appropriate referral, mentioned earlier as essential factors for preventing the long-term consequences of mental health disorders in children and youths (8, 9). Two studies showed an increased rate of diagnostic assessments (26, 47), while other studies reported more medication visits and prescriptions (32, 40, 42, 45). These findings raise discussion about the possible overdiagnosis and overtreatment of mental health disorders due to the usage of CDSMs. Earlier research has confirmed overdiagnosis and overtreatment in children and youths with ADHD (50). However, improved detection of these mental disorders may counteract the underdiagnosis and undertreatment that also exists in this population.

Strengths and limitations

This study has several limitations. First, it was difficult to compare the different studies due to differences in quality, study designs, and outcome measures. Second, some identified CDSMs were directed at a broad age range, including those of 25 years and older, and had generic output (e.g., self-reported medication visits and vital signs). Therefore, it was not always clear how these CDSMs could be beneficial for children and youths specifically. Third, in some studies it was unclear whether they included also children and youths. However, these studies were included because it was plausible studied CDSMs were directed at adults, children and youths. Fourth, most studies originated from the United States of America (USA) (25, 26, 32-34, 38, 40, 41, 43, 45-48), the United Kingdom (UK) (24, 28-31), and Australia (35-37), which indicates that region-specific healthcare regulations must be taken into account while interpreting the review results. The health systems of the USA, the UK, and Australia are similar in many ways. In these countries, GPs or primary care pediatricians can be approached for first-contact medical care. However, there are also notable differences, such as the 'gatekeeper' role for GPs in the UK and Australia (51-53). Furthermore, in the USA, access to mental health care can be inadequate, with more than 5000 mental health professionals in shortage areas, mostly situated in rural areas (54). The aforementioned factors influence which CDSMs are suitable for a particular general practice setting. For example, computerized CDSMs might be more suitable if a GP is the only point of entry for care by a specialist, while tele-communication methods might be more appropriate in regions with a shortage of and longer traveling distance to mental health professionals.

This study also has strengths. First, to include relevant studies, the authors used a priori inclusion and exclusion criteria. Second, to minimize errors in the selection and reading process, there were two searchers and readers of studies. Third, this study provides an overview of different types of CDSMs, which may be useful for PCPs with tight schedules, such as GPs. To the best of our knowledge, no current scientific literature provides such an overview.

Conclusion

To assist PCPs in early detection and management of mental health disorders among children and youths, easy to use CDSMs of good quality are needed which can provide advice on management or referral (8, 9, 12). Based on the current review, methods consisting of a combination of CBDSMs and tele-communication methods are advised. While this advice applies to healthcare systems in which there are sufficient resources and care providers, it does not apply to healthcare systems in which there are shortages and where choices have to be made regarding care provision; that is, where CDSMs may be used as an aid for triage. In these systems, clinical assessments of experts in the context of tele-communication methods may be restricted to 'severe' cases, as graded by an electronic system as part of a CBDSM. Electronic systems may be used by PCPs in 'mild' and 'moderate' cases without further clinical assessment by an expert in secondary mental health care. As for future research, we suggest more comparative multicenter studies (e.g., with a prospective cohort design) on a combination of CBDSMs with tele-communication methods in different health systems and different degrees of problem severity. These combined methods may consist of existing or newly researched CDSMs. Identified CDSMs that support multiple phases of clinical decision-making should have priority in future efforts.

Declaration

Ethics: The systematic review was in accordance with the Declaration of Helsinki.

Funding: The study was funded by departmental resources.

Conflict of interest: None.

Data availability statement: The data underlying this article are available in the article and in its online supplementary material.

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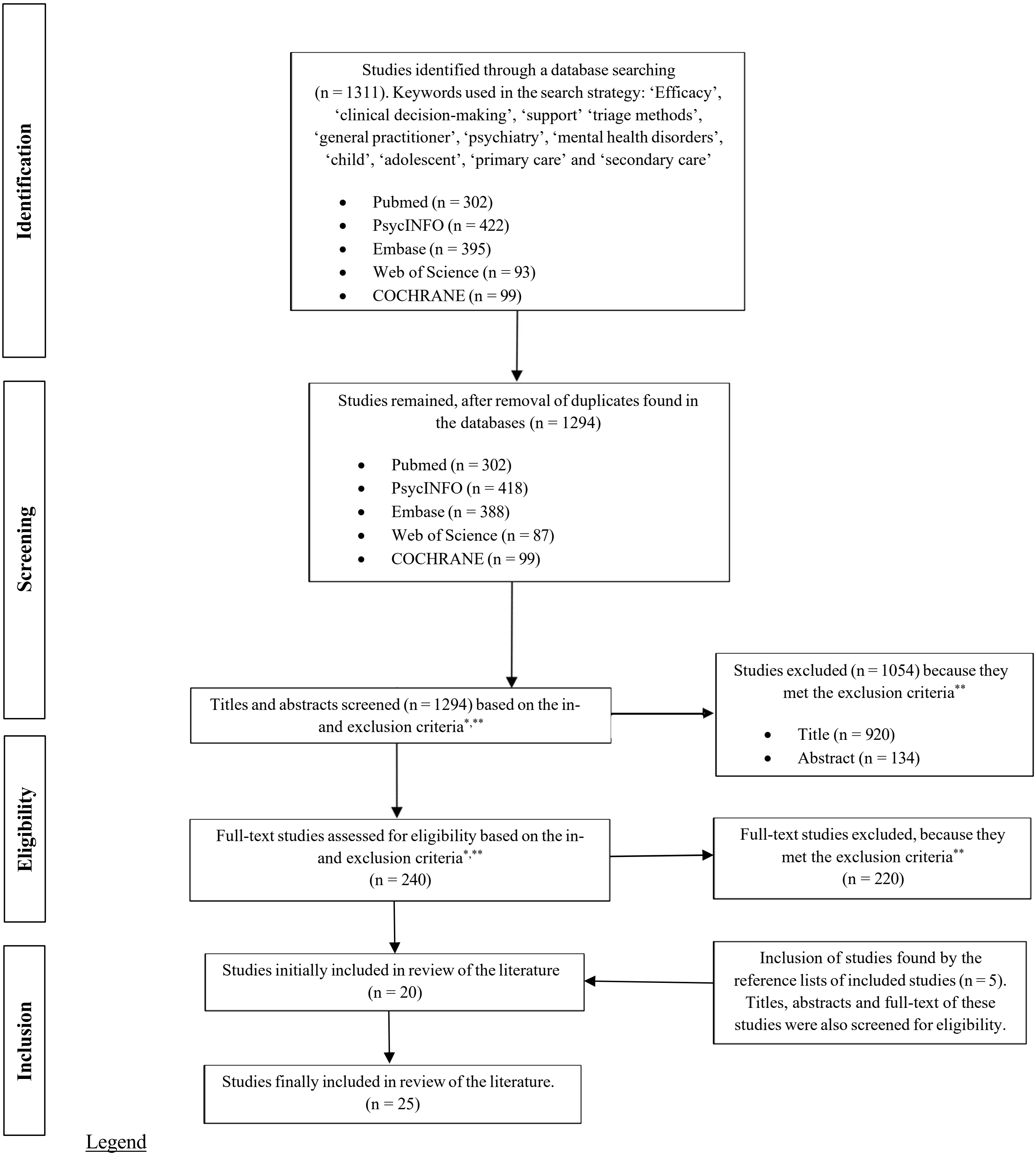
Figure 1: flowchart regarding selection of literature, 1294 studies published in 2009-2021



Legend

* Peer-reviewed studies that described CDSMs for mental health disorders among children and youths were included.

** Studies were excluded if the recruited participants were all aged 25 years or older and if the methods used fully consisted of a dichotomous screening instrument.

Table 1: Functionalities and content of clinical decision-support methods described in the included studies (N=25)

Study (authors, year)	Name	Target	Target children/youth	Targeted professionals	Goal	Content	Organization	CDM-phase(s) which CDSM supports[*]
Buckingham (2015)	MyGRaCE	Mental health (in general), associated risks of suicide, self-harm, harm to others, self-neglect, and vulnerability	Children/young persons who comply to criteria of targeted disorder(s)	Practitioners, type n.e.m.i.t.	To help service users assess and manage their own mental health collaboratively with practitioners	Decision support system which integrates service user and practitioner expertise about a variety of mental health areas. Data is collected as the service user answers questions based on a tree structure. Usage by practitioners requires a training workshop	Computer based decision-support methods	Diagnosis, assessment of severity
Bauer (2015)	Child Health Improvement through Computer Automation (CHICA) – ASD-module	Autism Spectrum Disorder (ASD)	Children of 18 years or younger with risk of ASD	PCPs	To improve management of ASD	Computer decision support system promoting adherence to clinical guidelines. It is designed to automate various aspects of preventive care and chronic disease management in the busy workflow of pediatric practice. CHICA produces a pre-screener form containing 20 health risk questions selected based on information in the child's EHR, which is completed by the parent or child (>12 years) prior to seeing the PCP. The form is scanned, after which a physician worksheet is generated which contains 6 prompts to guide PCP decision-making. Added ASD-module consists of validated screening questions specifically for ASD and it provides referral support	Computer decision support system and electronic health record (EHR)	Diagnosis, assessment of severity and management[**]
Downs (2019)	See Bauer (2015) – ASD module	Autism spectrum disorder (ASD)	Children aged 18 to 24 months	Pediatricians	To screen for autism spectrum disorders	The system communicates with the underlying electronic health record so that when a patient registers for care, CHICA analyzes the child's record (demographic characteristics, morphometric characteristics, diagnoses and medications) and selects the highest priority 20 yes or no questions, covering a wide range of primary care issues to ask the family. These are displayed on a sheet of scannable paper or an electronic tablet that is given to the family to complete in the waiting room	Computer-based decision support intervention	See Bauer (2015)
Carrol (2013)	See Bauer (2015) – ADHD-module	Attention Deficit/Hyperactivity Disorder (ADHD)	Children between 5-12 years old at risk for ADHD	PCPs	To assist physicians in the diagnosis and treatment of ADHD	See Bauer (2015). Added ADHD-module consists of screening questions following an algorithm based on the American Academy of Pediatrics. The module provides suggestions for ADHD-diagnosis, medication adjustments, mental health referrals and visits	See Bauer (2015)	See Bauer (2015)

Fortney (2013)	Net Decision Support System (NetDSS)	Primarily depression severity, suicide risk, secondarily cognitive impairment, generalized anxiety, panic, posttraumatic stress disorders and mania	Young people with depression symptoms and risk for suicide (approximately <5% of total study population was between 18-24 years old)	Depression care managers, who facilitate communication with e.g. PCPs and their patients	To provide evidence-based depression care management	NetDSS guides the care manager through a real-time self-documenting patient encounter using evidence based-scripts, self-scoring instruments, and clinical algorithms to identify new trials, treatment phases, and outcome milestones such as nonadherence, treatment response, remission, and relapse. It has the following functional capabilities: patient registry, patient encounter scheduler, trial management, clinical decision support, progress note generator, and workload and outcomes report generator	Web-based clinical decision support system	Diagnosis, management
Goodman (2000)	Development And Well-Being Assessment (DAWBA)	Among others ADHD, emotional, conduct, oppositional, posttraumatic stress, obsessive-compulsive, oppositional-defiant and conduct disorders. Separation anxiety, specific and social phobia, generalized anxiety and depression	Children and adolescents of 5-16 years old, susceptible for a variety of diagnoses	Child's clinician(s)	To generate ICD-10 and DSM-IV psychiatric diagnoses	DAWBA contains a package of questionnaires, interviews and rating techniques. Parents, teacher and children (if 11-16 years old) complete a structured interview after which parents can describe the problems in an open-ended questions-section. The different sorts of information are brought together by a computer program which produces summary sheets. Experienced clinical raters can use these sheets to accept or overturn the likely diagnoses generated by the computer. DAWBA requires little training, by reviewing online materials	Integrated computer based package of measures consisting of quantitative and qualitative information	Diagnosis, assessment of severity, management (n.e.m.i.t.)
Ford (2013)	See Goodman (2000)	Emotional, behavioural, autism spectrum, attention deficit hyper-activity, eating, feeding and tic disorders. Attachment issues	Children of 5-10 years, susceptible for a variety of diagnoses	See Goodman (2000)	See Goodman (2000)	See Goodman (2000)	See Goodman (2000)	See Goodman (2000)
McEwen (2016)	DAWBA-ASD-section	Autism Spectrum Disorder (ASD)	Children and adolescents in community mental health settings, at risk for ASD (all study partici-pants were aged	See Goodman (2000)	See Goodman (2000). In addition: to diagnose ASD	See Goodman (2000). In addition: the ASD module gathers information required to diagnose ASD. It can be completed by parents online or by interview and takes approximately 20 minutes to complete	See Goodman (2000)	See Goodman (2000)

			8-16 years)					
Moya (2005)	DAWBA-ED-section	Eating disorders (ED), such as anorexia, bulimia nervosa and partial syndromes	Children and adolescents at risk for ED, especially girls (7-17 years old)	See Goodman (2000)	See Goodman (2000). In addition: to generate DSM-IV and ICD-10 based diagnoses regarding eating disorders	See Goodman (2000). In addition: The ED-section begins with structured questions about eating-related symptomatology and its impact on the child's life. If definite symptoms are identified by the structured questions, clinicians use semi-structured open-ended questions to get respondents to describe the problems in their own words	See Goodman (2000)	See Goodman (2000)
Robinson (2018)	COMPASS (NAVIGATE)	First episode of psychosis	Patients aged 15 to 35 years (70.3% of total study population was 24 years or younger)	Prescribers	To facilitate patient-prescriber communication	Participants enter information about symptoms, side effects, treatment preferences, medication adherence and attitudes, and substance use into the system before consultation. Vital signs data and laboratory test results are entered. Data is summarized by the COMPASS program for review by the prescriber at the beginning of each medication visit. Integrating participant treatment priorities and the prescriber's assessments, COMPASS provided suggested guideline treatment, such as monthly assessments in the first two years of treatment	Computerized clinical decision making tool	Diagnosis, management
Reid (2013)	Mobiletype clinical assistant tool	Mental health symptoms (in general)	Young people with mild or more severe emotional/mental health issues (14-24 years old)	General practitioners	To assist in general practitioners' assessment and management	The *mobiletype* program is a mobile phone mental health assessment and management application which monitors mood, stress and everyday activities over eight areas of functioning, then transmits this information to general practitioners via a secure website in summary format for medical review	Mobile phone application	Diagnosis (n.e.m.i.t.), assessment of severity
Fletcher (2019 and 2021)	Link-me (randomized controlled trial)	Depression and anxiety symptoms	Youth aged 18-25, adults 26-75 years (19.5% of study partici-pants were aged 24 years or younger)	General practitioners	To test whether a patient-completed Decision Support Tool, which predicts future severity of depression and anxiety symptoms and triages individuals into care accordingly, is clinically effective and cost-effective relative to usual care	The first component of Link-me is a brief patient-completed decision support tool that draws on an individual's responses to 23 items to predict their anxiety and depressive symptom trajectory over the next 3 months and stratify them into one of three prognostic groups. The second component is a recommendation for treatment pathways, which depend on the predicted symptom severity	A model of Stepped Mental Health Care, a patient-completed decision support tool	Diagnosis, assessment of severity and management
Parker (2020)	Youth StepCare	Depression and anxiety	Youth patients aged 14 to 17 years	General practitioners	To identify youth with unidentified symptoms of mental illness	The service consists of three components: screening, treatment recommendations and patient monitoring. In the first component, practice staff offer a mobile tablet to patients	Web-based universal screening service on a mobile tablet	Diagnosis, assessment of severity and management

						and parent upon arrival for a GP appointment, patient completes the questionnaire on a mobile tablet in the waiting room (approximately 3 minutes). In the second component, symptom scores and clinical recommendations are sent to the GP's medical inbox, the GP discusses the results and forms a treatment plan with their patient. In the third component, fortnightly questionnaires are sent to patients who screened at mild, moderate or severe at baseline, results of monitoring questionnaires are sent to GP for review and follow-up		
Kaye (2017)	Child and Adolescent Psychiatrists Primary Care program (CAP PC)	Mild-moderate mental health problems	Children and adolescents aged 5 to 21 years	PCPs	To increase ability to assess and manage. To promote collaboration and integration of health and mental health services	Formal education of PCPs, consultation support by phone, assistance with linkage/referral and face-to-face evaluations in selected situations. CAP PC is unique in its collaboration among 5 university-based child psychiatry divisions. All CAP PC programs are provided free of charge to PCPs and include CME credit	Site teams with 2-3 senior child and adolescent psychiatrists, and 1 liaison coordinator	Diagnosis, assessment of severity and management
Gadomski (2014)	Training and Education for the Advancement of Children's Health (Project TEACH)	ADHD, depressive, anxiety and bipolar disorders; psychosis, sleep problems	Children with behavioural or emotional issues (age group n.e.m.i.t.)	PCPs	To provide training, consultation and referral support to build child and adolescent mental health expertise among primary care providers	Project TEACH refers to two programs, Child and Adolescent Psychiatry Education and Support Program for Primary Care Physician (CAPES) and CAP PC, that have similar aims but differ in scale, structure and service areas. Both offer free training, telephone consultations to PCPs, advice on referrals, and the ability to provide face-to-face evaluations if necessary. In both programs, calls from PCPs are handled by a central number and coverage is provided on a rotating basis	Combined program which integrates mental health services with primary care	Diagnosis, assessment of severity (n.e.m.i.t.) and management
Kerker (2015)	See Gadomski (2014). Study focusses on CAP PC	ADHD, psychosis, depression, anxiety, bipolar disorders	Children aged 0 to 21 years	PCPs	To correctly identify paediatric behavioural problems, effectively manage psychopharmacology and create and implement treatment plans by linking to existing resources	See Gadomski (2014). In addition: CAP PC consists of 15 hours in-person training, web-based learning tools, followed by a six-month distance learning program	See Gadomski (2014)	See Gadomski (2014)
Yellowlees (2008)	e-Mental Health (eMH)	Mood, anxiety, psychotic, pervasive developmental,	Children and adolescents younger than 18	PCPs	To provide multidisciplinary consultations by	In the eMH-program a consulting specialist meets with the patient who have been referred to UC Davis Medical Center via	Consultation-liaison model between PCPs, psychiatrists and a	Diagnosis, assessment of severity and management

		conduct and impulse control, attention-deficit/hyperactivity, adjustment, substance abuse and cognitive disorders. Mental retardation and childhood, emotional disturbances	years		videoconference, telephone, and e-mail as well as provider education	videoconferencing. At the end of the session, they would be joined by their PCP to discuss options, such as psychoeducation on medication, illness and diagnostic issues, exercise and lifestyle issues; a referral for therapy or testing if needed	clinical psychologist	
Epstein (2007)	Collaborative consultation treatment service	Attention Deficit/Hyperactivity Disorder (ADHD)-related symptoms	Stimulant-naïve children in first through fifth grades with an ADHD-related problem (mean age was 7.8 years)	Community-based physicians, pediatricians	To promote the use of titration trials and periodic monitoring during medication maintenance	Physicians are taught to prescribe 4 different weekly dosages of stimulant medication during a titration trial. These packaged medications were made available through local pharmacies. Weekly behavioural and side effect rating scales from parents and teachers are sent to a psychiatrist with ADHD-expertise who determined a best starting dosage of medication. A report describing the titration results, behavioural deteriorations or appearance of side effects (if this is the case) is sent back to physicians	Collaborative consultative service between community pediatricians and psychiatrists	Assessment of severity, management
Williams (2006)	Consultation-liaison	Mental health problems (in general)	Children	General practitioners	To assist general practitioners in making diagnoses and management plans	Psychiatrists participate in a roster and are on call to answer phone calls from general practitioners and to provide them with advice within 24 hours. In addition, if general practitioner, patient and psychiatrist agreed on this pathway, psychiatrists see the patient for face-to-face assessment within 14 days, with feedback to the general practitioner in a short time frame, preferably by an immediate telephone call, with written feedback within 14 days	Consultation-liaison service to general practitioners, provided by a cohort of private and public psychiatrists	Diagnosis, assessment of severity and management
Jacob (2012)	Telepsychiatry	Among others, major depressive disorder, generalized anxiety, seasonal affective and oppositional defiant disorders, ADHD; anxiety not otherwise specified	Children susceptible for a variety of diagnoses (aged 4-18 years)	PCPs	To diagnose and treat a wide range of psychiatric disorders, and to increase access to psychologists, psychiatrists and other therapists	A psychiatrist sees a child via videoconferencing for a limited number of sessions and then provides a treatment plan to that child's PCP and family	A telepsychiatry consultation practice between psychiatrist and PCP	Diagnosis, assessment of severity and management
Walter (2019)	Behavioral Health Integration	Common psychiatric disorders, such as anxiety, depression	Children (median age was 11	PCPs	To provide in-depth behavioural health education, on-demand	The behavioural health integration program consists of the following components: an education component which comprised 10	Multicomponent, transdiagnostic integrated	Diagnosis, assessment of severity and management

	Program	and ADHD	years)		psychiatric consultation, operational and clinical support for integrated practice transformation and on-site clinical behavioural health service	sessions (16 hours), a consultation component which provides real-time telephone consultation by child and adolescent psychiatrists, a transformation component focussing on i.a. clinical and business workflows and electronic health record documentation, and an on-site clinical behavioural health service focussing on screening, guided self-management and psychopharmacology	behavioural health model	
Malas (2019)	Michigan Child Collaborative Care (MC3) Program	Among others, ADHD and mood disorders	Children and youths under the age of 24	PCPs	To offer embedded behavioural health consultants within primary care practices, telephonic consultation, video consultation and embedded care	This program offers several levels of consultation and collaboration: behavioural health consultants who can provide referrals to local resources, brief in-person consultation, evaluation and non-pharmacologic intervention; formal telephone consultation with child and adolescent psychiatrists within the same business day of consult placement; videoconferencing with patients and families for more comprehensive telepsychiatric consultation; group case consultation for a group of PCPs in several areas of the state who wish to learn and discuss a series of cases together; and opportunities for embedded psychiatric care or in-person consultation	Telepsychiatry service	Diagnosis (n.e.m.i.t.), assessment of severity and management
Thompson (2019)	Collaborative care for depression intervention	Depression	Adolescents (12-25 years), adults (26->75 years)	PCPs	To support PCPs with screening, referral and treatment uptake of depressive symptoms	Patients are screened with the Patient Health Questionnaire-2 and the Patient Health Questionnaire-9 on the basis of an eligibility algorithm. Electronic health record data are used for sample characteristics, screening rates, referrals and treatment pathways	See column 'Name'	Diagnosis, assessment of severity and management
Campbell (2021)	Process changes of universal screening for autism	Autism Spectrum Disorder (ASD)	Patients aged 16 to 30 months	Resident and attending pediatricians	To identify children at risk for ASD who may be referred for further evaluation	The process change consisted of three phases. Phase 1 was changing the screening instrument (from M-CHAT-R to the POSI) and adding decision support. Phase 2 was adding automatic reminders. Phase 3 was adding a referral option for autism evaluations in primary care	A combination of a shorter and more sensitive screening instrument, staff training, clinical decision support, electronic health record automatic reminders, and primary care integration of autism evaluations	Diagnosis, management

Legend

PCP = Primary Care Physician
CDSM = Clinical Decision Support Method
N.e.m.i.t. = Not Explicitly Mentioned in Text
[*] According to Bajaj (2011)
[**] Including referral

Table 2: Studies supporting clinical decision-making methods for mental health disorders in children and youths in primary care (N=25)

Study (authors, year)	Objectives	Methods	Outcomes (provider)	Outcomes (patient)	Measurement moments	Intervention	Control	Targeted group	(N) Study participants	% Gender female (provider)	% Gender female (patient)	Mean age (patient)	Results (provider)	Results (patient)
Buckingham (2015)	To describe the development of a CDSS that integrates service user and practitioner expertise	Interviews, focus groups, agile software development and implementation of MyGRaCE	Satisfaction regarding MyGRaCE	Patient ability to assess their (un)safety, life changes, view of others, symptoms of unease, joint clinical decision-making and self-care	N.e.m.i.t.	MyGRaCE	N.a.	Service users with risk of suicide, self-harm, harm to others, self-neglect and vulnerability	115 service users	N.e.m.i.t.	N.e.m.i.t.	N.e.m.i.t.	Despite differences in assessing risks and safety, there was improved shared understanding of mental health risk between patients and practitioners	A challenge was how to provide flexible access without overwhelming and confusing users
Bauer (2015)	To add an Autism Spectrum Disorder (ASD)-module to an existing CDSS	Cross-sectional survey	PCP knowledge, beliefs and self-reported practice related to ASD	N.a.	0, 12, and 24 months after implementation .	ASD-module for CHICA	CHICA system without ASD-module	PCPs already using CHICA	Total of 126 participants control group size n.e.m.i.t.	Intervention 56%, control group: 62%	N.a.	N.a.	Self-reported use of validated screening tools for ASD. No changes in knowledge or attitudes	N.a.
Downs (2019)	To determine whether computer-automated screening and clinical decision support can improve Autism Spectrum Disorder (ASD) screening rates in pediatric primary practi-	Cluster randomized clinical trial, comparing ASD-screening rates in samples with or without screening module built into an existing	Clinician's response rates to screening results in the computer system	Screening rates, rates of positive screening results, new cases of ASD identified	The cluster randomized clinical trial was conducted between November 16, 2010 and November 21, 2012, outcomes were measured per patient	Decision support with the CHICA, integrated with workflow and with the electronic health record	N.e.m.i.t., 'control clinics' and 'without an ASD screening module built into an existing decision support software system'	Children aged 18 to 24 months in urban pediatric clinics of an inner-city county hospital system	274 children	N.e.m.i.t.	38.4%	N.e.m.i.t., age range 23-30 months	Among the 265 patients with positive screening results, physicians indicated any response in CHICA in 151 (57.0%)	Screening rates in the intervention clinics (not in the control clinics) increased from 0% at baseline to 68.4% in 6 months

	ces	decision support software system												and to 100% in 24 months. Screening results were positive for 265 of 980 children screened
Carrol (2013)	To determine if implementing Attention-Deficit/Hyperactivity Disorder (ADHD) diagnosis and treatment guidelines in a CDSS would result in better care, including higher rates of adherence to clinical care guidelines	A cluster randomized controlled trial in which the diagnosis and management of ADHD was studied after implementation of a CDSS in 4 practices. In the control group, screening was left to the discretion of the physician	Rate of use of structured diagnostic assessments	Number of ADHD core symptoms noted at time of diagnosis. Medication adjustments, reassessment of symptoms, mental health referral and visits	Data collection began 6 months after the module turned on in CHICA, continued until 6 months after the last patient was diagnosed with ADHD	CHICA ADHD-module	The ‘traditional’ CHICA system without the ADHD guidelines	Children with symptoms or signs of ADHD	A total of 84 patients. In the intervention and in the control group 42 patients	N.a.	In intervention group 31%, in control group 26%	N.e.m.i.t. (age range 5-12 years)	The rate of use of structured diagnostic assessments inceased significantly	The number of ADHD core symptoms noted at time of diagnosis vastly increased, preliminary analyses showed an increase in ADHD management
Fortney (2010)	To describe the development and functionality of a decision support system for the chronic care	Observational study on a joint development of the program by a cross-	Functional capabilities of NetDSS: clinical decision support, progress note generator, and workload and outcomes report	Number of patients being subjected to the NetDSS. Functional capabilities of NetDSS: patient	N.a.	Net-DSS	N.a.	N.e.m.i.t. (‘patients’, ‘chronic’, ‘depression’)	N.e.m.i.t. (‘three collaborative care implementation research	N.e. m.i.t.	N.e. m.i.t.	N.e. m.i.t.	Intervention protocols can be successfully converted to Web-based decision support systems that facilitate the implementation of	The NetDSS has been used to provide evidence-based depression care ma-

	model of depression treatment, known as collaborative care	functional design team of psychiatrists, depression care manager, information technology specialists, technical writers and researchers	generator	registry, patient encounter scheduler, trial management					projects' 'involving 11 DCMs and 845 patients')				evidence-based chronic care models into routine care with high fidelity	nagement to more than 1700 primary care patients. See Results (provider)
Goodman (2000)	To describe and validate the DAWBA based on community and psychiatric clinic samples	Observational study on DAWBA diagnoses, independent correlates and SDQ-profiles (emotional, conduct-oppositional and ADHD - hyperkinetic disorders)	Outcomes related to DAWBA as an epidemiological measure (i.e. reliability and validity), mental health & service provision	See 'Outomes (provider)'	At baseline and after 4-6 months.follow-up	DAWBA	N.a.	Children and adolescents of 5-16 years old	A total of 530 participants, 491 in community and 39 in clinical sample	N.a.	49% in community and 21% in clinical sample	Community sample 9.9 years, clinical sample 11.0 years	The rates of all psychiatric disorders were higher in the clinic than in the community sample. Subjects with and without DAWBA diagnoses differed markedly in external characteristics and prognosis. In the clinical sample, there was considerable overlap between DAWBA and case note diagnoses	See Results (provider)
Ford (2013)	To explore the application of the DAWBA as an adjunct to clinical practice with children in the UK	Randomized controlled trial of the disclosure of the DAWBA to the assessing practitioner versus assessment at normal	Outcomes related to parents and the child's teacher, who filled in the SDQ; as part of the DAWBA	Probability diagnoses of psychiatric disorder(s). Level of functioning for the child was measured using the Children's Global Assessment Scale	An initial assessment at baseline, and a second after 6 months follow-up	DAWBA-disclosed assessment	Assessment at normal	Patients susceptible for emotional, behavioural, autism spectrum, attention deficit hyperactivity, eating, feeding and tic	In total 235 participants. In intervention group 117, in control group 118	N.e. m.i.t.	N.e. m.i.t.	Children of 5-10 years	Exposure to the DAWBA increased agreement between the DAWBA and practitioners about anxiety disorders, but detected no other statistically significant increased agreement for other disorders, nor a reduced need for further assessment,	See Results (provider)

		and analyzed by ‘intention to disclose’		(CGAS)				disorders. Attachment issues					the number of difficulties recognized or influence on outcomes	
McEwen (2016)	To test the DAWBA as a tool for diagnosing Autism Spectrum Disorder (ASD) in community mental health settings	A general population sample was screened with the Childhood Autism Spectrum Test (CAST) (low score <12, high score ≥ 15). Parents filled in the ASD module of the DAWBA, families were visited at home; also the Autism Diagnostic Interview–Revised (ADI-R) and the autism diagnostic observation schedule (ADOS) were completed	Sensitivity, specificity, PPV, NPV and the rate of correct classification by the tool	See Outcomes (provider)	Specific measurement moments unspecified, DAWBA interview online or by telephone, ADI-R and ADOS during home visits	DAWBA ASD-section	Children at risk of ASD	Children and adolescents presenting in community mental health settings, at risk for ASD	A total of 377 participants, 101 unaffected co-twins of children with a diagnosis of ASD, 164 adolescents with low and 112 with high risk of ASD	N.a.	ASD-group 17%, co-twins group 47.5%, co-twins and low-risk group: 39%	ASD-group 10.0 years, affected co-twin group 9.9 years and unaffected co-twin group 11.6 years	DAWBA shows good test specifications: sensitivity (0.88) and specificity (0.85), high PPV (0.82-0.95) and NPV (0.90). 86% of children were correctly classified. Improved performance when used in conjunction with ADOS. High ASD-score correlation with ADI-R	See Results (provider)

Moya (2005)	To develop and validate the Eating Disorder (ED)-section of the DAWBA	Girls divided into three groups were assessed with the ED-section of the DAWBA	Sensitivity, specificity, predictive values and test-retest reliability	See Outcomes (provider)	Two measurement moments. Baseline at the beginning of the study, retest after 2-3 weeks	DAWBA ED-section	Clinical controls with depression, obsessive-compulsive disorder or gastrointestinal disease; community controls	Girls at risk for an ED	A total of 174 participants. 48 with an ED, 55 clinical controls in treatment for unipolar depression, obsesssive compulsive disorder or gastrointestinal disease; 71 community controls	N.a.	100%	ED-group 16.0 years, clinical controls group 14.5 years, community controls group 15.5 years	For the detection of any DSM-IV and ICD-10 ED, the final DAWBA diagnosis had a sensitivity of 100%, specificity of 94%, PPV of 88%, and a NPV of 100%. There was 95% agreement between the initial and repeat diagnoses (k = 0.81)	See Results (provider)
Robinson (2018)	To compare COMPASS to community clinician-choice treatment for the recovery from an initial psychotic disorder-episode	Cluster randomized study	N.a.	Self-reported medication visits and prescriptions side effects, Adherence Estimator-scale. Biological outcomes: Vital signs, blood glucose	Prescription data monthly. Outcomes (patient) at 0, 3, 6, 12, 18 and 24 months	COMPASS (NAVIGATE)	Community clinician choice	Patients aged 15-40 years	Total of 414 participants, 233 in intervention, 181 in control group	N.e.m. i.t.	27%	23 years	More medication visits & antipsychotic prescriptions. Fewer side effects. Less sedation and anticholinergic side effects. No effect on other side effects. Less nonadherence beliefs. Less increase of BMI. No effects on other vital signs and cardiometabolic laboratory findings	See Results (provider)
Reid (2013)	To examine the *mobiletype* program in primary care, in particular the extent to which the *mobiletype*	Referred and eligible patients were randomly assigned to a group in which mood,	General practitioners assessed the program. Doctor-patient rapport was assessed using the General Practice Assessment Questionnaire –	Perceived understanding of patient mental health, assistance in clinical decision-making about diagnosis and	Both groups self-monitored areas of functioning for 2 to 4 weeks	Mobiletype	Attention-comparison	N.e.m.i.t. (‘mild or more mental health concerns’)	A total of 114 participants were included, intervention group 68 and at-	N.e.m. i.t.	71.9%	18.1 years	Mobiletype: improved general practitioners’ understanding of functioning and clinical decision-making regarding medication/referral/ deciding about	See Results (provider)

	could provide clinical assistance, enhance doctor-patient rapport and lead to pathways to care	stress and daily activities were self-monitored or a group in which only daily activities were self-monitored. Monitoring data were collaboratively reviewed with their general practitioner	Communication and Enablement subscales and the Trust in Physician Scale. Pathway to care was measured using the Party Project's Exit Interview. Researchers were double blinded to group allocation	medication/referral					tention-comparison group 46				diagnosis; positive impact on communication, no impact on general practitioner-patient rapport nor pathways to care	
Fletcher (2019 and 2021)	To determine whether systematic identification of patients' symptom severity using a Decision Support Tool in general practice and provision of tailored treatment recommendations is clinically and cost effective compared to usual care	Pragmatic stratified randomised controlled trial. Participants were recruited and classified into three prognostic groups	N.a.	Psychological distress, measured on the 10-item Kessler Psychological Distress Scale	Six months post randomisation	Prognosis matched care	Usual care plus attention control	Adults aged 18-75 years reporting depressive or anxiety symptoms or use of mental health medication	1671 patients	N.a.	72.5%	15.0 years	N.a.	Prognosis-matched care was associated with greater reduction in psychological distress than usual care plus attention control at 6 months. This reduction was seen in the severe prognostic group, but not in the

													minimal/ mild group. No serious adverse effects were recorded
Parker (2020)	To assess the feasibility and acceptability of delivering the Youth StepCare service in Australian general practices	A 12-week uncontrolled trial in two general practices in NSW, Australia. Symptoms were assessed using two questionnaires for depressive and anxiety symptoms; feasibility and acceptability using a battery of questionnaires	General practitioner (GP) satisfaction with the service	Self-reported symptoms of anxiety or depression	Per patient, between August 2018 and January 2019	A web-based universal screening service delivered via a mobile tablet, Youth StepCare	N.a.	Youth patients aged 14 to 17 years who visited a participating GP during the screening period	Five GPs and 6 practice staff. Of 46 youth patients, 28 consented and 19 completed the screening instrument	N.e.m.i.t.	68.4%	15.21 years	GPs and practice staff were satisfied with the service, reporting that there was a need for the service and that they would use it again	Nine reported symptoms of anxiety or depression, two of which were new cases
Kaye (2017)	To describe a large collaborative care program that covers most of New York	Observational study since 2010 and pre-post evaluation of training	Number of registrations, phone calls and face-to-face evaluations. Two-weekly self-reported satisfaction, pre-post training knowledge, skills,	N.a.	PCP satisfaction 2-weekly after phone consultation. Perceived knowledge, skill and confidence anually 2013-2015	CAP PC	N.a.	PCPs	1931 registered PCPs	N.e. m.i.t.	N.e. m.i.t.	12.5 years	CAP PC has provided 8013 phone consultations and 17523 CME credits over 6 years. PCPs report very high levels of satisfaction and growth in confidence	N.a., practice level and patient level data are available when there is enough funding for future

			confidence											research
Gadomski (2014)	To describe how project TEACH engages PCPs, lead to changes in practice and what factors influence sustainability	Semi-structured interviews among two groups of PCPs, trained and untrained	Participation motivation, self-reported confidence, impact on clinical outcomes, such as medication prescription and developing treatment plans	PCP perceived impact on patient outcomes, such as aversion of bad outcomes, more effective detection of problems	Summer and fall of 2012	Project TEACH, study focusses on CAP PC	N.a.	PCPs	Total of 40 participants. 30 trained and 10 untrained PCPs	62%	N.a.	N.a.	Increased confidence and collaborative treatment in primary care. Sustainability depends on PCP practice context and implementation support	See Results (provider)
Kerker (2015)	To describe the impact of Project TEACH on the identification and treatment of mental health conditions	Observational study on trained (pre- to post-comparison) and untrained PCPs	N.a.	Prescription practices, diagnoses and follow-up care	Pre- and post-training: after 0 and 6 months and 27 hours	CAP PC	Random sample of PCPs	Project TEACH-trained PCPs	A total of 376 participants, 176 in intervention, 200 in control group	N.e.m.i.t.	N.e.m.i.t.	N.e.m.i.t. (age range 0-21)	N.a.	More psychotropic medication prescription in the trained group. Less (unconfirmed) effect on depression diagnoses, medication use and follow-up care
Yellowlees (2008)	To examine the diagnostic characteristics and referral outcomes for eMental Health from 10 primary care clinics in California	Analysis of 139 previous referrals of children via videoconferencing	N.a.	Rate of diagnosis of psychiatric disorders such as anxiety, cognitive decline, depression and psychosis	Per patient, initially and at 3 months follow-up	eMH	N.a.	Children and adolescents younger than 18 years old	139 participants	N.a.	N.e.m.i.t.	10.7 years	N.a.	Improved assessment of psychiatric disorders, especially attention deficit and mood

													disorders Videoconferencing improved mental health
Epstein (2007)	To test if a collaborative consultative service model would improve patient outcomes	Paediatric practices were assigned to a group (not) receiving access to the service	Use of evidence-based practices by paediatricians, knowledge related to the use of titration trials	Children's Attention Deficit/Hyperactivity Disorder (ADHD) symptommatology by systematic monitoring of medication effectiveness and by use of the Conners Parent and Teacher Rating scales	Self-reported provider outcomes pre- and post-intervention. Child outcome measures 0, 3 and 12 months after start of the trial	Titration trials in the context of collaborative consultation treatment services	Periodic medication maintenance	Children with ADHD-related symptoms	Fifty two pediatricians and their 377 patients	N.e.m.i.t. ('the two groups did not differ in sex composition')	36.3%	7.8 years	Increased use of evidence-based practices. However, many paediatricians did not fully use the services	Reduction in core ADHD-symptoms
Williams (2006)	To evaluate General Practitioner (GP) satisfaction and outcomes of a consultation-liaison service provided by psychiatrists	Evaluation of telephone advice and one-off assessment with feedback if necessary	GP and psychiatrist satisfaction & perceived barriers	N.a.	N.e.m.i.t.	Consultation-liaison	N.a.	GPs & psychiatrists	167 GPs and 27 psychiatrist	N.e.m.i.t.	N.e.m.i.t.	N.e.m.i.t.	High GP and psychiatrist satisfaction. Increase in GPs' knowledge and confidence while managing mental health problems. 100% retention of psychiatrists throughout the project	N.a.
Jacob (2012)	To establish a telepsychiatry consultation practice for children in rural areas	A 2-session telepsychiatry consultation, consisting of a psychiatric evaluation session and	PCP satisfaction	Parental satisfaction	N.e.m.i.t. regarding satisfaction. Child Behavior Checklists (CBCLs) at 0, 3 and 6 months	Telepsychiatry consultation practice	N.a.	PCPs	15 children	N.e.m.i.t.	33%	9 years	Satisfaction as reported by PCPs was high	Parental satisfaction was high. Not enough follow-up CBCLs were returned to determi-

		a recommendation session												ne changes in patient symptoms
Walter (2019)	To assess the structure and process of pediatric behavioural health integration and outcomes in patient experiences (access and quality), cost and provider satisfaction	Evaluation of a multi-component, transdiagnostic integrated behavioural health model in a large pediatric primary care network in Massachusetts, launched in 2013	Practice-level behavioural health integration, ambulatory behavioural health spending, self-efficacy and professional satisfaction from participation	Practice-level psychotherapy, medical behavioural health visits and guideline-congruent medication prescriptions	At baseline and 5-year follow-up	Behavioral Health Integration Program	Care as usual (n.e.m.i.t.)	Pediatric primary care practitioners	~105 PCPs serving ~114000 patients	N.e.m.i.t.	N.e.m.i.t.	N.e.m.i.t.	Increased practice-level behavioral health integration, total ambulatory behavioral health spending increased by 8% in constant dollars over 5 years, mainly attributable to task-shifting from specialty to primary care. Total emergency behavioral health spending decreased by 19%. Providers reported high behavioral health self-efficacy and professional satisfaction from participation	Increased practice-level psychotherapy and medical behavioral health visits, guideline congruent medication prescriptions for anxiety, depression and ADHD
Malas (2019)	To obtain qualitative and quantitative information from PCPs relating to their experience in using telephonic consultation services with child and adolescent psychiatrists through the Michigan Collaborative Child Care Program	A survey was conducted over a 5-year period to assess PCP attitudes and perception regarding MC3 consultation, including measures of efficiency, user-friendliness and confidence in provi-	See 'methods'	N.a.	Over 5 years, following each consultation	Michigan Child Collaborative Care (MC3) Program	N.a.	PCPs	1241 PCPs enrolled in MC3 (44% response rate)	N.e.m.i.t.	N.e.m.i.t.	N.e.m.i.t.	Common themes elicited included perception of improved patient care, improved comfort and confidence, greater comfort with prescribing and monitoring of psychotropics and improved access to mental healthcare	N.a.

		ding mental healthcare												
Thompson (2019)	To analyze effectiveness of screening, referrals and treatment uptake of a collaborative care for depression intervention across 10 primary care clinics in Chicago	Patients were screened with the Patient Health Questionnaire -2 and -9. Electronic health record data were analyzed	N.a.	Depression symptoms. Sample characteristics, screening rates, referrals and treatment pathways	Between November 2016 and December 2017	Collaborative Care for Depression of Adults and Adolescents	N.a.	Adults and Adolescents with symptoms indicative of Major Depressive Disorder	1008 patients	N.a.	63.0%	N.e.m.i.t., 20% of the sample were between ages 12 and 25, and 19% were between ages 26 and 35	N.a.	Screenings, referrals and uptake occurred proportionately across subgroups except for patients ages 12-17. Adolescent age was associate with disproportionate Patient Health Questionnaire-9 screenings and with treatment disengagement
Campbell (2021)	A quality improvement study to 1) increase the proportion of visits with screening for autism and 2) to increase the proportion of visits with	Process changes were implemented in 3 phases: 1) changing screening instrument and adding decision	N.a.	Proportion of visits with autism screening at 2 intervention clinics before and after implementation of process changes versus 27 community	During primary care visits, over 2 years (baseline and phased improvements)	Process changes of universal screening for autism	Care as usual, n.e.m.i.t. (‘community clinics’)	Children susceptible for autism	12233 well-child visits	N.a.	48.0% in intervention and 48.8% in community sample	45.3% <24 years in intervention, 55.0% in community sample	N.a.	Improved autism screening and referrals. Autism screening increased by 52% in intervention,

referrals for autism evaluation	support 2) adding automatic reminders & 3) adding a referral option for autism evaluations	clinics	21% in community clinics. See study for results per phase

Legend

CDSM = Clinical Decision-Support Method
PCP = Primary Care Physician
N.a. = Not Applicable
N.e.m.i.t. = Not Explicitly Mentioned in Text

Table 3: Quality appraisal scores of 25 included studies (published 2009-2021), using the Crowe Critical Appraisal Tool (CCAT)

	Total (max = 40)	Score*	Prelim	Intro	Design	Sample	Data	Ethics	Results	Discussion
Buckingham (2015)	★★	24	4.75	5	2.75	3.33	0.83	2	2.25	3.17
Bauer (2015)	★★★	28.67	5	5	3.5	3.17	2.5	2	3.5	4
Downs (2019)	★★★★	33.38	5	5	3.25	5	3.97	3.5	4.5	3.16
Carrol (2013)	★★★	30.40	5	5	3.75	2.83	3.83	2.5	3.5	4
Fortney (2010)	★	20.49	4.5	5	2.5	1.17	2.17	1	1.32	2.83
Goodman (2000)	★★★	29.83	5	2.5	4.25	4.67	4	3	3.25	3.17
Ford (2013)	★★★★	35.17	5	5	4.75	3.83	4.67	3	4.25	4.67
McEwen (2016)	★★★★	34.42	4.75	5	4.5	4.67	4	3	3.5	5
Moya (2005)	★★★	32.33	3.75	5	4.5	5	3.33	2	3.75	5
Robinson (2018)	★★★★	32.83	4.75	5	4.5	4	3.33	2.5	3.75	5
Reid (2013)	★★★★	35.08	5	5	4.5	4.83	3.33	3.5	4.25	3.83
Fletcher (2019 and 2021)**	★★★	32.23	5	5	2.69	4.91	3.89	3.75	3	3.99
Parker (2020)	★★★	29.15	4.75	5	2.61	3.66	3.14	3.5	3	3.49
Kaye (2017)	★	22.68	5	5	2.76	3.33	2.83	2	3.75	3.5
Gadomski (2014)	★★	25.96	4	5	2.63	3	3.33	1	3.5	3.5
Kerker (2015)	★	21.22	3.50	3	2.95	2.91	1.92	1.11	2.19	3.64
Yellowlees (2008)	★★★	29.67	4.75	5	3.42	3.5	2.5	2.5	3	5
Epstein (2007)	★★★	32	4.75	5	4.25	3.83	2.83	3	3.75	4.5
Williams (2006)	★	21.33	4.75	5	2.58	2.5	1.17	1	2	3.33

Jacob (2012)	★★	25.87	4.75	5	2.37	2.17	2.83	2.5	2.75	3.5
Walter (2019)	★★★	29.23	4.75	5	2.85	4.15	2.98	3	2,5	4
Malas (2019)	★★	27.8	4.75	5	3.09	3.49	2.81	2.5	2.5	3.66
Thompson (2019)	★	22.3	3.75	5	2.5	2.32	2.15	1.5	2.25	2.83
Campbell (2021)	★★	27.21	4.75	5	3.25	2.32	2.15	2.5	2.75	4.49

<u>Legend</u>

Max = Maximum
Prelim = Preliminaries
Intro = Introduction

[*] One star: more than 1 SD below average; two stars: between 1 SD below average and average; three stars: between average and 1 SD above average; four stars: more than 1 SD above average.

[**] Because Fletcher (2019) consists of a protocol which is expanded on in Fletcher (2021), displayed scores are mean scores of the two studies. For the categories ‘Results’ and ‘Discussion’, scores for Fletcher (2021) are mentioned.

Chapter 4 - Burnout, depression and anxiety in preclinical medical students: a cross-sectional survey

(Published in International Journal of Adolescent Medicine and Health, 2015)

Abstract

Objectives

The purpose of this study was to assess the prevalences and correlates of adverse affective states (burnout-, depression- and anxiety-related symptoms) among preclinical medical students.

Methods

Self-report questionnaires were sent to all preclinical medical students of Leiden University Medical Center (n=1311). Burnout-related symptoms were measured using the Maslach Burnout Inventory-General Survey (MBI-GS), depression and anxiety-related symptoms and vitality using the Symptom Questionnaire-48 (SQ-48). Furthermore, duration of sleep, quality of life (SF-36), need for recovery, happiness and dispositional optimism were assessed and analysed in relation to affective symptoms using regression analysis.

Results

Among the 433 responders (response rate = 33.0%), prevalences of self-reported burnout-, depression- and anxiety-related symptoms were 46.0% (n=199), 27.0% (n=117) and 29.1% (n=126) respectively. Independent correlates for burnout-related symptoms were less than 6 h sleep per night ($p = 0.02$), low happiness ($p < 0.001$) and a high need for recovery ($p < 0.001$). Independent correlates for both depression- and anxiety-related symptoms were low optimism ($p < 0.001$; $p < 0.001$ respectively), low happiness ($p < 0.001$; $p = 0.001$ respectively) and a high need for recovery ($p = 0.03$; $p < 0.001$ respectively).

Conclusions

Prevalences for adverse affective states were high among preclinical medical students and mainly associated with personality trait-related factors and need for recovery, rather than work-related factors.

These findings suggest that being a medical student increases one's risk to adverse affective states, and should inspire preventative initiatives.

Introduction

Previous studies showed that adverse affective states among non-university students, university students and medical students in particular are a relatively common phenomenon (1,2). In the last decade, several studies have been conducted on adverse affective states among medical students and the coverage in popular media has grown. The most prevalent categories of symptoms indicating adverse affective states among medical students are burnout-, depression- and anxiety-related symptoms. Prevalences of burnout-, depression- and anxiety-related symptoms among medical students vary from 45% to 71%, 6.0% to 66.5% and 7.7% to 65.5% respectively (3,4). These broad ranges could be explained by differences in used measurement instruments, study-phase in the medical education and nationality of the medical students between these studies. Dyrbye *et al.* described several consequences of adverse affective states among medical students, such as serious impaired academic performance, cynicism towards patients, academic dishonesty, substance abuse and suicide (1). Burnout during medical school could have a negative impact on the self-reported patient care, personal health and well-being of the medical student (4). Ibrahim *et al.* indicated that depression in medical students could have a negative impact on the interpersonal, social and occupational functioning of the medical student (2). Moreover, anxiety may be a cause for alcohol abuse among this population (5).

Several correlates for adverse affective states in medical students have been identified. Worrying about own financial situation may correlate with burnout in medical students, low family income may correlate with depression and anxiety (3,6). Studies have provided inconclusive results on the correlation between gender and depression or anxiety-related symptoms (3,5). Although no differences in mental health between medical students and their peers seem to exist before starting medical school, medical students' mental health is thought to deteriorate by each consecutive year of the medical training (1,3). The need for recovery (NFR) is defined as 'the need to recuperate from work-induced fatigue experienced after a day of work'. Contrary to the association between a high NFR and burnout, the association between low dispositional optimism and burnout is still unclear (7,8). Certain personality traits may influence medical students' experience of symptoms indicative of adverse affective states (5). A high dispositional optimism, defined as 'a personality characteristic which is conceptualised as a generalised expectation that good things will happen', may lower the risk of depressive symptoms; similar to emotional vitality, characterised by 'a sense of energy, positive well-being, and effective emotion regulation' (9-11).

Studies regarding the prevalence, causes and consequences of adverse affective states among preclinical medical students have been conducted in the US, some in European countries and few in countries elsewhere in the world, such as China (12). Two Dutch studies in 2011 and 2012 gave an alarming overview of the prevalences of adverse affective states among Dutch medical students. A study from the Academic Medical Center in Amsterdam showed that prevalences of self-reported stress-, depression- and anxiety-related symptoms among clinically not yet active students were 20%, 41% and 32% respectively, and a study from the Erasmus Medical Center in Rotterdam showed that there was a high need for counselling among preclinical medical students (13,14). This study also showed that psychological distress was associated with life-events and experiences with fellow medical students.

It is essential that a study is performed in which correlates for disorder-specific symptoms are explored, considering the amount of studies that found high prevalences of adverse affective states among medical students and described potential negative consequences. These independent correlates per disorder could be used to identify symptoms indicative of adverse affective states in medical students more accurately that could be done using previously found broader correlates. This could help to develop preventive interventions. The aim of this study is to assess the prevalences of self-reported burnout-, depression- and anxiety-related symptoms among preclinical medical students and to identify potential independent correlates.

Methods

Study design

The medical study at Leiden University Medical School consists of a bachelor and master program of three years each. The last two years comprise clinical rotations (internships), starting in the second year of the master program. A self-report questionnaire comprising five measurement instruments was sent to all 1311 preclinical medical students of Leiden Medical University, Leiden, the Netherlands. Participation in the study was voluntary. The students were given the option to participate in a separate lottery in which four €25,- gift coupons were raffled. At the end of the academic year 2013-2014 (June 2014) the students were sent an e-mail explaining the goal of the study. In this e-mail the students received a link to background information of the study and the online survey. A declaration of no objection was granted by the Institutional Ethics Review Board of Leiden University Medical Center (LUMC). Because of possible psychological distress due to the survey, the student psychologists of Leiden University were informed about the study.

Of the 1311 approached medical students, 520 (39.7%) responded, and 433 (33.0%) who provided complete data were included in the study. All students in the first to fourth year of medical school were included. Interns and students who discontinued medical school for more than 6 months were excluded. Medical students were also excluded if they did not complete the test-battery (Figure 1).

Data collection

During 3 months, data were anonymously collected using an online survey-tool, Surveymonkey® (Surveymonkey Inc.). At the start of the academic year 2014-2015 (September 2014) three reminders were sent. Posters at the university, announcements on social media and presentations at class meetings were used as promotional activities.

Measurement instruments

Socio-demographic characteristics and possible correlates were measured using a demographic questionnaire. This included questions about gender, age, date of starting medical school, current subject, native language, partnership status, housing situation, number of children, number of sick leave days in past year, overall happiness (on a Likert scale from 0 through 10), questions based on the past 2 weeks of their study: the number of hours per week spent on the study, number of hours slept on average per night, (equal to or above 4 on a Likert scale from 1 to 5 was considered as a high amount of sleep loss), self-rated physical health and self-rated mental health (equal to or below 2 on a Likert scale from 1 to 5 was considered as a poor self-rated physical or mental health). Additional questions were questions about whether the student had a side job, was part of a fraternity, was part of a study association, whether the student worried about the financial situation and questions about the social safety net for the student in case of self-reported psychological distress. These correlates were identified using the literature and discussed in a working group with experts on the field. This working group consisted of medical teachers, and representatives of the medical interns union of Leiden University Medical Center.

Maslach Burnout Inventory-General Survey

Burnout-related symptoms were measured with the Dutch version of the Maslach Burnout Questionnaire-General Survey (UBOS-GS) (15,16). The MBI-GS measures three domains of burnout: emotional exhaustion/U-subscale (5 items, Cronbach's α 0.88), depersonalisation/D-subscale (5 items, α 0.75) and personal accomplishment/C-subscale (6 items, α 0.74) (15). Items were rated on a 7-point Likert scale of 0-6 (0=never, 6=always or daily). To define whether a respondent is 'burned out' or 'not burned out', three mean scores on the U- D- and C-scale must be calculated. A high mean score on emotional exhaustion (≥2.20) and depersonalisation (≥2.00) or a lower mean score on personal accomplishment (≤3.16) is suspected of being 'burned out'. These cut-off values are based on a reference population consisting of scientific and academic personnel in the Netherlands (n=349) (16).

Symptom Questionnaire-48 (SQ-48)

Prevalences of depression- and anxiety-related symptoms were measured using the Dutch version of the MOOD- (6 items, Cronbach's α 0.93) and ANXI- (6 items, α 0.92) subscales of the Symptom Questionnaire-48 (SQ-48). The VITA-subscale (6 items, α 0.90) was used to assess vitality; the higher the score, the more efficient one's emotion regulation is. The SQ-48 (published in 2014) is meant to be available in the public domain for routine outcome monitoring (ROM). It can be used as a screening/monitoring tool in clinical settings (psychiatric and non-psychiatric), as a benchmark tool, or for research purposes (17). Contrary to the Brief Symptom Inventory (BSI), it allows measuring emotional vitality, has briefer and clearer questions and has not been used before in studies on adverse affective states among medical students (18,19). Items are rated on a 5-point Likert scale of 0-4 (0=never, 4=very often).To calculate the total score, the scores on the subscales must be added (without the VITA- and WORK- subscale). Cut-off values indicate a discrimination threshold between 'healthy' and 'diseased' (17).

Life Orientation Test-Revised (LOT-R)

Dispositional optimism was measured using the Life Orientation Test-Revised (LOT-R, α 0.68). It is the most commonly used instrument in psychological research to measure optimism (10). The LOT-R consists of 10 items. Four items are filler items and thus not used in the scoring. The other six items are scored on a 5-point Likert scale (0=strongly disagree, 4=strongly agree); the higher the score, the more positive one's attitude in life is. To compute the LOT-R sum score, three negatively worded items must be reversely recoded (10,20). The LOT-R score ranges from 0-24, and a cut-off of 12 or lower indicates low dispositional optimism (21).

Need for Recovery Scale (NFR)

The Need for Recovery scale (NFR, α 0.88) is part of the Questionnaire on Perception and Assessment of Labour. The NFR can be used as a preventive screening tool for fatigue at work. It measures problems workers experience in recovering from the efforts and stress at work. The participant is asked to indicate whether a statement applies to him, which is measured on a 2-point Likert scale (yes=1, no=0). The NFR consists of 11 statements and results in a score or percentage of 0-100%. The higher the sum scores, the higher the need for recovery after a working (study) day. A widely used cut-off value is 54.5%. This score can be reached by giving positive answers on 6 questions (22,23).

Data analysis

Descriptive analyses were used to describe the socio-demographic and participant-specific characteristics, and to examine the prevalences of symptoms indicative of the adverse affective states of interest. In a univariate analysis, chi-squared tests (Pearson χ^2-test) and t-tests (t-test for Equality of Means) were used to compare the outcomes of the groups with and without symptoms indicative of adverse affective states. In a multivariate analysis, a forward stepwise regression was used to compare potential independent correlates among these groups. In this forward stepwise regression analysis, the z-scores of the variables optimism (LOT-R) score, vitality (SQ-48 VITA) score, happiness score and need for recovery score were used with a standard deviation of 1 and a mean of 0. Age and sex were used as entered variables. To guard against multicollinearity, the variance inflation factor (VIF) score for each variable in de predictor models was examined. We used a stringent rule of thumb cut-off criterion of two for deciding when a given independent variable displayed multicollinearity, which was the case for the variables self-rated mental health and vitality; these variables were excluded from the multivariable models. This yielded odds ratios (OR) with their accompanying 95% confidence intervals (95% CI). All tests were two-tailed with $p<0.05$ denoting statistical significance. The statistical analyses were conducted using SPSS version 21.0 (IBM corp., NY, USA).

Results

Characteristics and prevalences of burnout-, depression- and anxiety-related symptoms

Of the 433 included medical students 75.5% were female. The mean age was 21.2 (SD=2.0; interquartile range IQR=17-33 (20-22)). Medical students had been in medical school for an average of 2 years and 10 months. Fiftyone percent was part of a fraternity, 23.1% was part of a student association (Table 1). In case of self-reported psychological distress medical students would most likely seek help with their parents or relatives (79.7%), or friends (76.9%), following by their partner (40.4%), a general practitioner (35.1%), a student psychologist (20.6%), a confidant (9.0%) and other sources of help (6.2%; including a psychologist).

Of the 433 medical students 199 (46.0%, Table 2) fulfiled the criteria for self-reported symptoms indicative of burnout, 117 (27.0%, Table 3) indicative of depression and 126 (29.1%, Table 4) indicative of anxiety. Mean scores on the MBI-GS U-, D- and C- subscales, SQ-48 MOOD and SQ-48 ANXI were 3.27 (standard error of the mean SE=0.06), 1.68 (SE=0.06), 3.52 (SE=0.04), 6.39 (SE=0.22) and 9.03 (SE=0.23) respectively.

Independent correlates of burnout-related symptoms

The univariate analysis showed many variables which associated with burnout-related symptoms (Table 2). Variables which correlated independently and strongly with burnout-related symptoms were shown by the multivariate analysis. Less than 6 h sleep per night (OR 2.00; 95% CI 1.12-3.60) and need for recovery (OR 1.66; 95% CI 1.31-2.11) were risk-enhancing correlates; happiness (OR 0.50; 95% CI: 0.38-0.66) was a protective correlate.

Independent correlates of depression-related symptoms

In the univariate models, many variables were associated with depression-related symptoms (Table 3). The multivariate analysis showed variables which correlated independently and strongly with depression-related symptoms. A risk-enhancing correlate was need for recovery (OR 1.42; 95% CI: 1.03-2.00); protective correlates were optimism (OR 0.44; 95% CI: 0.31-0.62) and happiness (OR 0.18; 95% CI: 0.11-0.29) (Table 2).

Independent correlates of anxiety-related symptoms

The univariate analysis showed many variables associated with anxiety-related symptoms (Table 4). The multivariate analysis yielded variables which correlated independently and strongly with anxiety-related symptoms. The variable need for recovery (OR 1.90; 95% CI: 1.43-2.52) was a risk-enhancing correlate; happiness (OR 0.61; 95% CI: 0.45-0.81) and optimism (OR 0.46; 95% CI: 0.34-0.63) were protective correlates.

Discussion

This study in 433 preclinical medical students from Leiden University showed that 46.0% suffered from symptoms indicative of burnout, 27.0% of depression and 29.1% of anxiety. The multivariate analyses showed independent correlates for self-reported symptoms indicative of adverse affective states. Correlates for burnout were ;6 hours sleep per night, low happiness and a high need for recovery. Correlates for depressive and anxiety-related symptoms were low optimism, low happiness and a high need for recovery.

Our findings are largely consistent with the wide prevalence ranges of burnout-, depression- and anxiety-related symptoms described in previous studies among medical students; 45-71%, 6.0- 66.5% and 7.7-65.5% respectively (3,4). Prevalences of depression-related symptoms were lower than those showed by aforementioned Dutch studies, prevalences of anxiety-related symptoms were similar (13,14). By way of comparison, the mean score for burnout-related symptoms in our study was in between a 'healthy' working population and a population consisting of workers with work-related neurasthenia (16). The same applied for depression- and anxiety-related symptoms, for which the mean scores were in between a Dutch 'healthy' reference group and a psychiatric outpatient group with suspected mood, anxiety or somatoform disorders (24). Therefore, these findings give rise for concern, as it suggest that being a medical student increases one's risk to adverse affective states.

Correlates for symptoms indicative of adverse affective states were partially consistent with previous studies. Contrary to these studies, our results showed no association between time since start of medical school and depression-related symptoms (1,3). Although in some studies financial concerns were associated with anxiety-related symptoms, our results showed no such association (3). In concordance to several other studies, we found no association between gender and symptoms indicative of adverse affective states (3,5). The correlation between poor perceived level of support from the medical faculty and adverse affective states is frequently described in previous studies; this could be an explanation why our results suggest that medical students tend to seek help at family and friends instead of mental health services offered by the faculty (4,25,26). Personality traits, such as impulsivity and poor self-awareness, have been associated with symptoms indicative of adverse affective states; but these personality related factors were not part of our study (5,6). In accordance to our results, an association between high optimism scores and lower scores on emotional exhaustion of the MBI has been described before (27). Although this study aimed to identify disorder-specific correlates, our results showed that most independent correlates associated with all three examined disorders. While many work- related factors were explored, most of these correlates for adverse affective states were personality trait-related.

Strenghts and limitations of the study

This study has several strengths. First, this study explored disorder-specific correlates of adverse affective states among medical students, while most previous studies showed broader correlates.

Second, the results give deeper insight in which proportion work-related and personality trait- related factors correlate with these symptoms. There are some limitations to our study as well. First, because of the cross-sectional study design cause-effect relationships cannot be explored. Second, the generalisability is limited by the inclusion of medical students of only one institution. Furthermore, the response rate was rather low with 33%. However, comparable response rates are common in such types of online questionnaires (14,28,29). Third, some variables were dichotomised which may have reduced statistical power.

Future directions

This study aims to be a next step in the exploration of adverse affective states among non-clinical medical students worldwide. In addition, this study is aimed to inspire further research with a follow-up design in which medical schools of other countries are investigated. To increase study generalisability, medical students of multiple institutions have to be included. The findings of this study may be used in future initiatives to lower adverse affective states. Although most studied initiatives focus on improving access to mental health services, Slavin *et al.* proposed several effective curricular changes which aim for cohesion between fellow students (e.g. instituting longitudinal students electives and establishing learning communities) (26). However, introducing this model may inflict substantial changes to most existing medical curricula. We suggest that a more universal model is explored which targets medical students' self-awareness and collective awareness of adverse affective states (1,4).

Conclusion

We conclude that prevalence proportions for adverse affective states are high among medical students, and associated with workload- and personality-related factors. To confirm these prevalences and to explore these relationships further, we recommend multicentre studies with a longitudinal follow-up design. Medical schools are in the position to recognise distress among their students. The correlates found by our study could be used to identify individual students who are at risk for adverse affective states. Since medical students primarily seek help from family and friends in case of distress, medical schools should prioritise raising medical students' self-awareness and collective awareness instead of improving faculty mental health services.

Therefore, universal curriculum models which focus on group engagement and self-awareness are needed to support institutions in establishing an optimal learning environment for future doctors.

Acknowlegdements

Special thanks go to prof. dr. R. Reis for facilitating the contact between the researcher and drs.
P.C. Barnhoorn, which was crucial to the conception of this study. We thank Elmer Mackor (Directorate of Education, LUMC) for providing us with the information to calculate the response rate.

Conflict of Interest

The authors declare no conflict of interest.

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Figure 1: Flowchart of participants

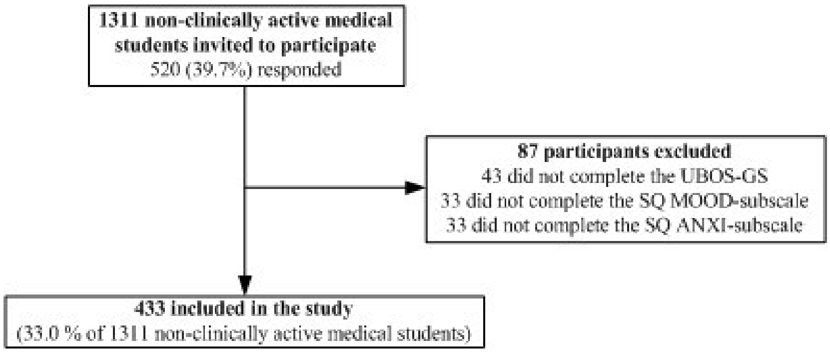


Table 1: Characteristics of medical students (N=433)

Variable	*Data*
Socio-demographic variables	
Female sex - n (%)	327 (75.5)
Age, yr - mean ± SD	21.2 ± 2.0
Age, yr - range (IQR)	17-33 (20-22)
Time since start of medical school, years - mean ± SD	2.8 ± 1.4
Partnership status - n (%)	
• Living alone with partner/ married	28 (6.5)
• Not married	405 (93.5)
Housing situation - n (%)	
• With parents	86 (19.9)
• Student housing (shared facilities)	279 (64.4)
• Private housing (own facilities)	68 (15.7)
Having children - n (%)	5 (1.2)
Native language Dutch - n (%)	394 (91.0)
Part of fraternity - n (%)	221 (51.0)
Part of study association - n (%)	100 (23.1)
Having a side job - n (%)	285 (65.8)
Possible correlates for adverse affective states	
>48 hours per week spent on studying - n (%)	20 (4.6)
<6 hours sleep per night - n (%)	72 (16.6)*
High amount of sleep loss due to medical school - n (%)	60 (13.9)
Worries about own financial situation - n (%)	177 (40.9)
Poor self-rated physical health - n (%)	117 (27.0)
Ten or more sick leave days in past year - n (%)	44 (10.2)
Consulted study adviser for psychological distress before - n (%)	93 (21.5)
Optimism (LOT-R) score (0-24) - mean ± SE	14.41 ± 0.19
Happiness (0-10) - mean ± SD	7.65 ± 1.60
Need for recovery score (NFR) score (0-100) - mean ± SE	46.61 ± 1.13

SD=standard deviation, IQR=interquartile range, SE=standard error of the mean

* 5 missing values

Table 2: Comparisons between 433 non-clinically active medical students with and without burnout-related symptoms (N=433)

	Univariate			**Multivariate**	
	No burnout (n=235)	**Burnout** (n=199)	**P-value**	**OR (95% CI)**	**P-value**
Socio-demographic variables					
Female sex - n (%)	184 (78.6)	143 (71.9)	0.10	0.67 (0.40-1.10)	0.11
Age, yr - mean ± SE	21.0 ± 0.13	21.3 ± 0.16	0.23	1.04 (0.93-1.16)	0.55
Time since start of medical school, yrs - mean. ± SE	2.80 ± 0.08	2.88 ± 0.11	0.56		
Partnership status - n (%)					
• Living together with partner/ married	15 (6.4)	13 (6.5)	0.96		
• Not married	219 (93.6)	186 (93.5)			
Housing situation - n (%)					
• With parents	52 (22.2)	34 (17.1)	0.18		
• Student housing (shared facilities)	151 (64.5)	128 (64.3)			
• Private housing (own facilities)	31 (13.2)	37 (18.6)			
Having children - n (%)	**5 (2.1)**	**0 (0.0)**	**0.04**		
Native language Dutch - n (%)	209 (89.3)	185 (93.0)	0.19		
Part of fraternity - n (%)	116 (49.6)	105 (52.8)	0.51		
Part of study association - n (%)	55 (23.5)	45 (22.6)	0.83		
Having a side job - n (%)	161 (68.8)	124 (62.3)	0.16		
Possible correlates for burnout- related symptoms					
>48 hours per week spent on studying - n (%)	11 (4.7)	9 (4.5)	0.68		
<6 hours sleep per night - n (%)	**23 (9.8)***	**49 (24.6)****	**<0.001**	**2.00 (1.12-3.60)**	**0.02**
High amount of sleep loss due to medical school – n (%)	**18 (7.7)**	**42 (21.1)**	**<0.001**		
Worries about own financial situation - n (%)	**83 (35.3)**	**94 (47.2)**	**0.01**		
Poor self-rated physical health - n (%)	**46 (19.7)**	**71 (35.7)**	**<0.001**		
Ten or more sick leave days in past year - n (%)	**15 (6.4)**	**29 (14.6)**	**0.005**		
Consulted study adviser for psychological distress before - n (%)	**38 (16.2)**	**55 (27.6)**	**0.004**		
Optimism (LOT-R) score (0-24) - mean ± SE	**15.3 ± 0.23**	**13.4 ± 0.29**	**<0.001**		
Happiness score (0-10) - mean ± SE	**8.19 ± 0.08**	**7.01 ± 0.12**	**<0.001**	**0.50 (0.38-0.66)**	**<0.001**
Need for recovery score (NFR) score (0-100) - mean ± SE	**39.7 ± 1.39**	**54.8 ± 1.65**	**<0.001**	**1.66 (1.31-2.11)**	**<0.001**

Bold items are statistically significant at a p-value <0.05; OR=odds ratio; CI=95% confidence interval; SE=standard error of the mean.

* 1 missing value

** 4 missing values

Table 3: Comparisons between 433 non-clinically active medical students with and without depression-related symptoms (N=433)

	Univariate			Multivariate	
	No depression (n=316)	**Depression** (n=117)	**P-value**	**OR (95% CI)**	**P-value**
Socio-demographic variables					
Female sex - n (%)	242 (76.6)	85 (72.6)	0.40	0.74 (0.36-1.49)	0.40
Age, yr - mean ± SE	21.1 ± 0.10	21.3 ± 0.25	0.54	0.93 (0.80-1.08)	0.33
Time since start of medical school, yrs - mean. ± SE	**2.72 ± 0.07**	**3.15 ± 0.14**	**0.003**		
Partnership status - n (%)					
• Living together with partner/ married	17 (5.4)	11 (9.4)	0.13		
• Not married	299 (94.6)	106 (90.6)			
Housing situation - n (%)					
• With parents	**55 (17.4)**	**31 (26.5)**	**0.02**		
• Student housing (shared facilities)	**216 (68.4)**	**63 (53.8)**			
• Private housing (own facilities)	**45 (14.2)**	**23 (19.7)**			
Having children - n (%)	4 (1.3)	1 (0.9)	0.72		
Native language Dutch - n (%)	290 (91.8)	104 (88.9)	0.35		
Part of fraternity - n (%)	**171 (54.1)**	**50 (42.7)**	**0.04**		
Part of study association - n (%)	80 (25.3)	20 (17.1)	0.07		
Having a side job - n (%)	212 (67.1)	73 (62.4)	0.36		
Possible correlates for depression-related symptoms					
>48 hours per week spent on studying - n (%)	13 (4.1)	7 (6.0)	0.48		
<6 hours sleep per night - n (%)	**41 (13.0)***	**31 (26.5)****	**0.001**		
High amount of sleep loss due to medical school - n (%)	**33 (10.4)**	**27 (23.1)**	**0.001**		
Worries about own financial situation - n (%)	**116 (36.7)**	**61 (52.1)**	**0.004**		
Poor self-rated physical health - n (%)	**68 (21.5)**	**49 (41.9)**	**<0.001**		
Ten or more sick leave days in past year - n (%)	**22 (7.0)**	**22 (18.8)**	**<0.001**		
Consulted study adviser for psychological distress before - n (%)	**51 (16.1)**	**42 (35.9)**	**<0.001**		
Optimism (LOT-R) score (0-24) - mean ± SE	**15.6 ± 0.19**	**11.2 ± 0.34**	**<0.001**	**0.44 (0.31-0.62)**	**<0.001**
Happiness score (0-10) - mean ± SE	**8.26 ± 0.06**	**6.00 ± 0.16**	**<0.001**	**0.18 (0.11-0.29)**	**<0.001**
Need for recovery score (NFR) score (0-100) - mean ± SE	**41.5 ± 1.24**	**60.3 ± 2.00**	**<0.001**	**1.42 (1.03-2.00)**	**0.03**

Bold items are statistically significant at a p-value <0,05; OR=odds ratio; CI=95% confidence interval; SE=standard error of the mean.

* 4 missing values

** 1 missing value

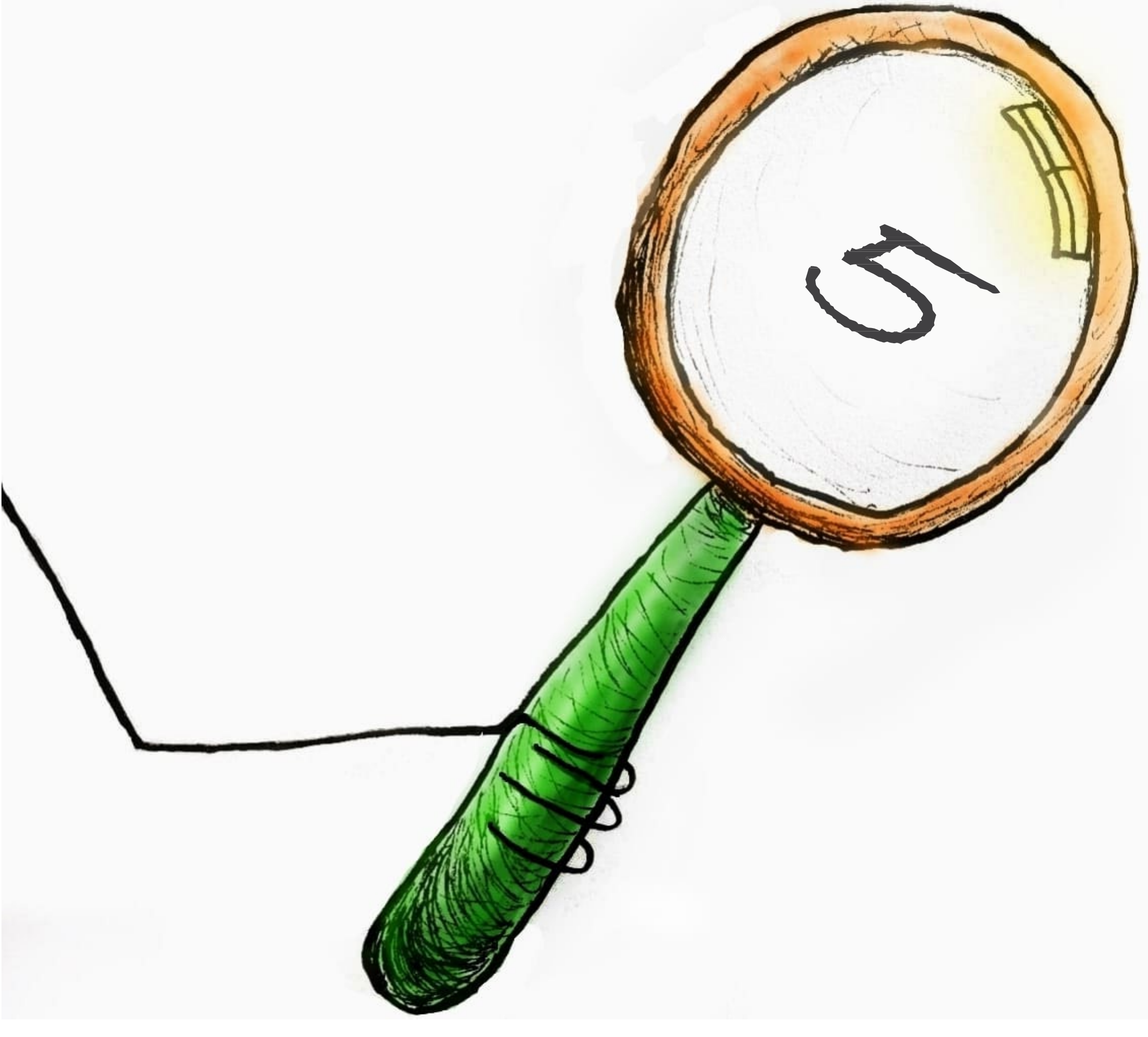
Table 4: Comparisons between 433 non-clinically active medical students with and without anxiety-related symptoms (N=433)

	Univariate			Multivariate	
	No anxiety (n=308)	**Anxiety** (n=126)	**P-value**	**OR (95% CI)**	**P-value**
Socio-demographic variables					
Female sex - n (%)	231 (75.2)	96 (76.2)	0.84	0.94 (0.52-1.73)	0.85
Age, yr - mean ± SE	21.1 ± 0.11	21.2 ± 0.21	0.86	0.96 (0.85-1.09)	0.56
Time since start of medical school, yrs - mean. ± SE	2.79 ± 0.08	2.95 ± 0.13	0.27		
Partnership status - n (%)					
• Living together with partner/ married	**15 (4.9)**	**13 (10.3)**	**0.04**		
• Not married	**292 (95.1)**	**113 (89.7)**			
Housing situation - n (%)					
• With parents	62 (20.2)	24 (19.0)	0.65		
• Student housing (shared facilities)	200 (65.1)	79 (62.7)			
• Private housing (own facilities)	45 (14.7)	23 (18.3)			
Having children - n (%)	5 (1.6)	0 (0.0)	0.15		
Native language Dutch - n (%)	278 (90.6)	116 (92.1)	0.62		
Part of fraternity - n (%)	152 (49.5)	69 (54.8)	0.32		
Part of study association - n (%)	70 (22.8)	30 (23.8)	0.82		
Having a side job - n (%)	208 (67.8)	77 (61.1)	0.19		
Possible correlates for anxiety-related symptoms					
>48 hours per week spent on studying - n (%)	13 (4.2)	7 (5.6)	0.62		
<6 hours sleep per night - n (%)	**39 (12.7)***	**33 (26.2)****	**0.001**		
High amount of sleep loss due to medical school - n (%)	**32 (10.4)**	**28 (22.2)**	**0.001**		
Worries about own financial situation - n (%)	**111 (36.2)**	**66 (52.4)**	**0.002**		
Poor self-rated physical health - n (%)	**66 (21.5)**	**51 (40.5)**	**<0.001**		
Ten or more sick leave days in past year - n (%)	**25 (8.1)**	**19 (15.1)**	**0.03**		
Consulted study adviser for psychological distress before - n (%)	**47 (15.3)**	**46 (36.5)**	**<0.001**		
Optimism (LOT-R) score (0-24) - mean ± SE	**15.5 ± 0.20**	**11.7 ± 0.32**	**<0.001**	**0.46 (0.34-0.63)**	**<0.001**
Happiness score (0-10) - mean ± SE	**8.06 ± 0.08**	**6.64 ± 0.16**	**<0.001**	**0.61 (0.45-0.81)**	**0.001**
Need for recovery score (NFR) score (0-100) - mean ± SE	**40.7 ± 1.20**	**61.1 ± 2.04**	**<0.001**	**1.90 (1.43-2.52)**	**<0.001**

Bold items are statistically significant at a p-value <0,05; OR= odds ratio; CI=95% confidence interval; SE=standard error of the mean.

* 3 missing values

** 2 missing values



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Chapter 5 - Prevalence and risk factors of burnout-related symptoms in medical interns

(Under review at European Review of Applied Psychology)

Abstract

Introduction

The stressors that medical students are exposed to may increase the risk of stress-related symptoms.

Objective

We aimed to investigate the prevalence and correlates of burnout-related symptoms among medical interns.

Method

An extensive questionnaire was sent to 709 medical interns to assess burnout-related symptoms, work engagement, work pace and quantity, need for recovery, and dispositional optimism, of whom 426 responded (60.1%). The groups with and without burnout-related symptoms were compared using multivariable logistic regression analysis, to yield independent correlates for burnout-related symptoms.

Results

Of the interns 30.5% fulfilled criteria for moderate to severe symptoms indicative of burnout, and 16 (3.8%) of severe symptoms. This prevalence was higher than the Dutch reference group, mainly due to increases in emotional exhaustion (95% CI 17.1-17.9) and depersonalisation (95% CI 7.3-7.7), but not of personal accomplishment. Independent correlates for burnout-related symptoms were low levels of work dedication (95% CI 0.26-0.79), high work pace and quantity (95% CI 1.01-1.06), high need for recovery (95% CI 1.02-1.05) and low dispositional optimism (95% CI 0.78-0.95).

Conclusion

The prevalence of burnout-related symptoms among medical interns was high and associated with workload- and personality-related risk factors. Future initiatives should aim at timely identifying risk factors in young doctors to prevent burnout symptoms through organisation-directed interventions.

Introduction

Life as a doctor or medical student poses particular challenges and stressors, which can impact on quality of life (Dyrbye et al., 2005; Henning et al., 2009). Medical schools are thought to be stressful environments for medical students, which may increase incidences of stress-related symptoms in this population (Puthran et al., 2016). In the last few years, multiple studies on this phenomenon were published, many of them focusing on burnout-related symptoms (Puthran et al., 2016; Silva et al., 2017; van Venrooij et al., 2015; Dyrbye et al., 2006, 2017; Wolf and Rosenstock, 2017; Fares et al., 2016; Seweryn et al., 2015; IsHak et al., 2013). Adverse affective states among medical students, such as burnout-related symptoms, may lead to impaired development on the social, academic and personal dimension (Dyrbye et al., 2005; Hope and Henderson, 2014). According to recent literature, burnout-related symptom prevalences vary from 45 to 71%, depending on used measurement instrument, study phase in the medical education and nationality of medical students (van Venrooij et al., 2015; IsHak et al., 2013; Hope and Henderson, 2014). Furthermore, in the literature, no fewer than 142 different characterisations of burnout have been used, leading to a wide variety of prevalence estimates (Rotenstein et al., 2018). The definition which is by far the most commonly used in the literature is the definition by Maslach and Jackson: ‘Burnout is a syndrome of emotional exhaustion, depersonalisation, and reduced personal accomplishment that can occur among individuals who do ‘people work’ of some kind (Maslach et al., 1997)’, which we have also employed in the current study. Traditionally, burnout is thought to manifest later in a career, after idealism and enthusiasm may have given way to routine and monotony in some. However, the last decade has shown burnout-related symptoms to be more prevalent in junior compared to senior doctors, which has been given increasing coverage in popular media (IsHak et al., 2013). Two studies on the prevalences of adverse affective states among Dutch preclinical medical students showed prevalences of self-reported stress-related symptoms of 20% and burnout-related symptoms of 46% (van Venrooij et al., 2015; Gaspersz et al., 2012). However, when medical students changed from theoretical studies to patient-centered internships as part of the medical curriculum, they appeared to be at particular high risk of burnout-related symptoms (IsHak et al., 2013). During this phase of graduate training, they need to find a balance between training and private life. This transition is sometimes perceived as stressful, especially when interns feel that they are being overburdened. This is illustrated by relative high prevalence proportions of burnout-related symptoms in interns in the literature, ranging from 28 to 61% (IsHak et al., 2013).

Several risk and protective factors for burnout-related symptoms in medical professionals have been identified. The risk for burnout is evidently increased by a higher workload and work pace. Moreover, it is higher in those medical professionals who are younger, are at the start of their career, do not have a partner and do not have children (Demerouti et al., 2001). Women tend to experience more emotional exhaustion compared to men, whereas men tended to score higher on depersonalisation compared to women (Backovic et al., 2012). The type of medical specialty did not affect burnout-related symptoms among residents in one study (Martini et al., 2004).

There is evidence that intrapersonal skills and personality traits may serve as either risk factors for and protective factors against burnout. A sense of engagement with work may be a protective factor against burnout-related symptoms. Engagement can be defined as a separate construct, but there is some construct overlap as the opposite of burnout (Demerouti et al., 2001; Schaufeli and Bakker, 2003). To our knowledge, no research has been performed on possible relationships between engagement and burnout-related symptoms among medical interns. A high *need for recovery* (NFR), that is the need to recuperate from work-induced fatigue, experienced after a day of work, can also be a risk factor for burnout (Dyrbye et al., 2010; Jansen et al., 2002). Dispositional optimism, being a stable personality trait defined as the generalised tendency towards positive outcome expectations, is considered protective against development of somatic illness and depressive symptoms (Giltay et al., 2006). Previous literature showed no independent correlation between dispositional optimism and burnout-related symptoms (van Venrooij et al., 2015). However, it would be interesting to explore further the relation with dispositional optimism, as high optimism may increase resilience against burnout-related symptoms in medical interns.

In order to fill up above-mentioned spaces in the literature, we aimed to assess the prevalence of burnout-related symptoms among medical interns using the Dutch version of the Maslach Burnout Questionnaire-General Survey (UBOS-GS) (Maslach et al., 1997; Schaufeli and van Dierendonck, 2000). In addition, the independent risk factors for burnout-related symptoms were explored using a set of six questionnaires. We hypothesised that the prevalence would be increased relative to the general working population, with increased emotional exhaustion most pronounced, and that there would be unique intrapersonal protective factors involved such as work engagement and dispositional optimism. Such factors may be key to find the balance between patient care and self-development.

Methods

The term medical intern can lead to confusion. A medical intern is a term used in the United States for a physician in training who has completed medical school. In many other countries, like the Netherlands, undergraduate medical education ends with a period of practical training called *internships*. The medical study at the LUMC consists of a bachelor and master program of 3 years each. The last 3 years comprise internships, starting in the second year of the master program. All medical interns and recently graduated physicians registered at the *Office of Education and Training* of the LUMC at the 1st of May 2013 were included. They were sent an email explaining the goal of the study with an attachment containing background information. They were asked to participate via an online self-report questionnaire. The respondents were asked to answer a total of six validated questionnaires, of which one was used to assess the prevalence of burnout-related symptoms and five were used to explore possible risk and protective factors. Participation in the study was voluntary. As an incentive for taking part in the study, fifteen gift certificates were raffled. Prior to the study, a declaration of no objection was granted by the Institutional Ethics Review Board of LUMC (see below).

Data collection

Over the course of 1 month, data were anonymously collected using an online survey-tool. All medical interns who did not complete the set of questionnaires were sent three email reminders and one reminder sent in a posted letter to their home address. Promotional activities were undertaken in the form of posters at the university and affiliated hospitals and via social media.

Measurement instruments

Five (sections of) questionnaires were included based on previous research (Dyrbye et al., 2010; Giltay et al., 2006; Prins et al., 2010). Demographics include gender, age, date of internship start, current internship, mother language, university where preclinical years were followed, partnership status, housing arrangements, number of children, number of sick leave days in past year. Furthermore, medical interns were asked to answer questions based on the past two weeks of internships: the number of hours per week spent on their internship including studying time, number of hours slept on average per night, loss of sleep due to their internship, self-rated physical health and self-rated psychological health. Lastly, we assessed overall happiness (on a Likert scale from 0 to 10).

Maslach Burnout Inventory (MBI)

Burnout-related symptoms were measured with the Dutch translation of the *Maslach Burnout Inventory* (MBI), the *Utrechtse BurnOut Schaal* (UBOS) (Maslach et al., 1997; Schaufeli and van Dierendonck, 2000). According to the definition by Maslach and Jackson, it measures three domains of burnout: emotional exhaustion/U-subscale (8 items, Cronbach's α in this study = 0.88), depersonalisation/D-subscale (5 items, $\alpha = 0.68$) and personal accomplishment/C-subscale (7 items, $\alpha = 0.76$). These Cronbach's alphas were comparable to those previously published (Maslach et al., 1997). Table I describes a hierarchical solution from Omega analysis in R on the individual items of the UBOS, that applies the Schmid-Leiman transformation (R Foundation, 2021; Table I). In order to provide evidence of construct validity of the MBI, a confirmatory factor analysis (CFA) was conducted with burnout as the second-order factor and burnout's components as first-order factors. Therefore, we used several indices for evaluating the model fit: the Comparative Fit Index (CFI), the Tucker-Lewis Index (TLI), the standardised root mean square residual (SRMR), and the root mean square error of approximation (RMSEA) and its 90% confidence interval (CI). To evaluate the fit indices, the following cut-off criteria were used: (1) for CFI and TLI, values of >0.9 indicate good model fit, 0.8–0.9 indicate acceptable fit, <0.8 indicate poor fit; (2) for RMSEA, values of <0.05 indicate close fit, 0.05–0.10 indicate adequate fit, >0.10 indicate poor fit; (3) for SRMR, values of <0.08 indicate acceptable fit (Byrne, 1989; Brown, 2006; Hu and Bentler, 1999; Table II).

Items were rated on a 7-point Likert scale of 0-6 (0=never, 6=always or daily). A high mean score on emotional exhaustion and depersonalisation or a lower mean score on personal accomplishment was considered indicative of being 'burned out'. Unlike the original version of the MBI, the UBOS provides cut-off scores for moderate to severe burnout. A person is considered to suffer from moderate burnout-related symptoms if he or she has either a sum score ≥ 19.92 on emotional exhaustion and > 7.95 (women) or > 8.95 (men) on depersonalisation, or a sum score ≥ 19.92 on emotional exhaustion and ≤ 25.97 on personal accomplishment. A person is considered to suffer from severe burnout-related symptoms if he or she has either a sum score ≥ 28.96 on emotional exhaustion and ≥ 10.15 on depersonalisation, or a sum score ≥ 28.96 on emotional exhaustion and ≤ 24.29 on personal accomplishment. To date, these cut-off scores have not been extensively validated as a diagnostic tool in clinical practice. Therefore, further studies are needed on the MBI/UBOS to assess its validity as a screening tool for clinical psychodiagnostics in individuals (Schaufeli and van Dierendonck, 2000). A case is 'diagnosed' as being burned out if the individual scores above the 75th percentile on the EE- and DP scale or below the 25th percentile on the PA-scale (Schaufeli and van Dierendonck, 2000). This decision rule has been validated in multiple accuracy analyses (Maslach et al., 2009). For example, one study compared UBOS scores of 44 well-functioning individuals with those of 29 individuals diagnosed as suffering from burnout, in order to develop a guideline for obtaining a dichotomous measure of burnout (Brenninkmeijer and VanYperen, 2003). The reference data presented in the manual were based on 10,552 Dutch health care employees.

This is a heterogeneous group of people from various medical professions in different medical settings (i.e. doctors, nurses, dentists and paramedics). The mean age of the reference group was 37 years and 55% was male (Schaufeli and van Dierendonck, 2000).

Utrecht Work Engagement Scale (UWES)

Engagement was measured using the 9-item *Utrecht Work Engagement Scale* (UWES) (Prins et al., 2010). Items were rated on a 7-point Likert scale. The questionnaire has good psychometric properties and consists of three engagement subscales: vigor (3 items, Cronbach's α in present study 0.83), dedication (3 items, α = 0.85) and absorption (3 items, α = 0.74).

Work Pace and Quantity Scale (WPQ) and Need for Recovery Scale (NFR)

Work pace and quantity (WPQ) and need for recovery (NFR), both sections of the *Questionnaire on Perception and Assessment of Labour*, were used (van Veldhoven et al., 2002). The WPQ-scale contains 11 statements about work pace and quantity, which are rated on a 4-point frequency scale. Reference values were provided in the Dutch manual and were based on 97,132 subjects. The NFR-scale measures if professionals experience problems in recovering from the efforts and stress at work. The scale consists of 11 statements, of which the employee is asked to indicate whether the statement applies to him or her (yes=1, no=0). Higher sum scores indicate a higher level of NFR, with a cut off value of 6 considered as increased NFR.

Life Orientation Test-Revised (LOT-R)

Dispositional optimism was assessed by using the *Life Orientation Test-Revised* (LOT-R) (Glaesmer et al., 2012). The LOT-R consists of ten items of which four statements are filler items. These items are not used in scoring. The six items are scored on a 5-point Likert scale. Three negatively worded items were reversely coded for computation of the LOT-R sum score, ranging from 0 to 24, with higher scores indicative of higher optimism. Low dispositional optimism was defined yielding a sum score of 12 or lower (van de Rest et al., 2010).

Data analysis

Descriptive analyses were used to describe medical interns' demographic and internship-specific characteristics and to examine the prevalences of burnout-related symptoms and work engagement. T-tests for independent samples were used to compare outcomes for interns with those of the Dutch reference group. One sample t-tests were done to compare subscale means to the reference values. Cohen's *d* effect sizes (standardised difference in means) were used to gain insight into the clinical relevance of differences. A Cohen's *d* effect size of ≤0.20 indicates a negligible difference, an effect size of 0.20–0.50 indicates a small difference, 0.50–0.80 a medium and >0.80 a large difference. Chi-squared test and t-tests for independent samples were used for comparisons among the groups with and without burnout-related symptoms. Logistic regression analyses were used to compare potential independent correlates among these groups, in which we included all correlates with a significance level <0.10 in the multivariable model. This yielded odds ratios (OR) with their accompanying 95% confidence intervals (CI). All tests were two-tailed with $p<0.05$ denoting statistical significance. Data were analysed with SPSS 26.0 statistical software (SPSS Inc). The omega coefficient was used as an estimate of reliability, with a Schmid Leiman transformation. The "lavaan" (version 0.6-9) and "psych" (version 2.0.12) packages for the R statistical software were used for the CFA and omega analyses (R version 4.0.3; R Foundation for Statistical Computing, Vienna, Austria, 2016. URL: https://www.R-project.org/).

Results

Reliability of the Maslach Burnout Inventory (MBI)

The MBI (Dutch UBOS) contained eight items for the emotional exhaustion domain, five items for the depersonalisation domain and seven items for the personal accomplishment domain (Maslach et al., 1997;

Schaufeli and van Dierendonck, 2000). The (Omega) exploratory factor analysis showed that all items correlated with the general factor 'burnout' (range: 0.21-0.55), except for 'I feel fatigued when I get up in the morning and have to face another day on the job'. The total Omega was 0.90 and the Cronbach's alpha was 0.87. Communality (h2) ranged from 0.18 – 0.72, uniqueness (u2) from 0.28 – 0.82 (Table I). Furthermore, confirmatory factor analysis yielded an adequate fit between the three-factor with 20-item model structure and the data (Table II), confirming the three-factor structure described by Maslach et al. (1997; Maslach et al., 1997). The fit indices from the confirmatory factor analysis showed a CFI of 0.848, a TLI of 0.828, a RMSEA of 0.081 (90%CI: 0.074 - 0.088) and a SRMR of 0.085.

Characteristics and prevalences of burnout-related symptoms

Of the 709 medical interns approached, 462 responded (65.2%), of whom 426 (60.1%) completed the entire set of questionnaires. In order to analyse the possible correlates, partially completed questionnaires were excluded, resulting in a moderately sized sample (n=426) (Figure 1). A total of 67.4% of the 426 respondents included in this study were female. The average age was 24.1 ([SD]=2.1; interquartile range [IQR]=22.8-24.8). 27% were married or cohabiting with their partners and 2% had children. Respondents had been doing their internships for an average of 1 year and 2 months (while the total length of internships is 2 years and 2 months). All students except one (0.2%) received their bachelor's degree at the LUMC (Table III).

Of the 426 interns who completed the questionnaires, 130 (30.5%) were suffering from moderate to severe symptoms indicative of burnout, 16 of whom (3.8%) were suffering from severe symptoms indicative of burnout. Moderate to severe symptoms of burnout were mainly due to increases in emotional exhaustion (17.5, SE=0.4 vs reference value of 14.5; Cohen's *d*=0.46; p<0.001) and –to a lesser extent– depersonalisation (7.5, SE=0.2 vs reference value of 6.1; Cohen's *d*=0.37; p<0.001), whereas the mean level of personal accomplishment was not decreased (Cohen's *d*=0.04; p=0.44; Figure 2).

Independent correlates of burnout-related symptoms

Potential independent correlates between the groups (with and without burnout-related symptoms) were analysed using logistic regression analysis. The univariate model yielded several significant correlates (Table IV). Sociodemographic variables did not differ among subjects without and with burnout-related symptoms. These correlates were further explored in a multivariate model (in which we included all correlates with a significance level $p<0.10$). The odds ratios for burnout were decreased for the UWES-dimension dedication (OR: 0.45; 95% CI: 0.26-0.79) and dispositional optimism (OR: 0.86; 95% CI: 0.78-0.95). The odds ratios for burnout-related symptoms were increased for work pace and quantity (OR: 1.03; 95% CI: 1.01-1.06) and need for recovery (OR: 1.04; 95% CI:1.02-1.05; Table IV).

Discussion

Our main finding was that 30.5% of medical interns fulfilled the criteria for moderate to severe burnout-related symptoms, with 3.8% suffering from severe symptoms indicative of burnout. Mainly increased emotional exhaustion and to a lesser extent increased depersonalisation were the dimensions of burnout most affected. The independent correlates we found suggested that there are risk factors and protective factors involved. The multivariate analysis of these factors showed high work pace and quantity, low dedication, high need for recovery, and low dispositional optimism to be the independent risk factors.

Our findings fit within the prevalence range identified in previous studies done in populations consisting not only of medical interns, but also of medical students and residents (van Venrooij et al., 2015; Dyrbye et al., 2006, 2011; IsHak et al., 2013; Hope and Henderson, 2014; Prins et al., 2007; Ripp et al., 2011). In comparison, a national survey among the general Dutch workforce showed that only 13% of this study population suffered from burnout-related symptoms (Koppes et al., 2011). This strongly suggests that the prevalence of burnout-related symptoms among the interns of the institution we examined is higher compared to the general working population. Preclinical medical students of our university hospital, also reported a high prevalence of 46.0% of burnout-related symptoms. The latter prevalence seems higher as both studies used the Maslach Burnout Inventory, but different reference populations were used causing cut-off values to be slightly lower in the study among preclinical medical students. Furthermore, the 2015 study used the MBI-GS, which uses slightly different wordings in order to be more comprehensive to medical students (van Venrooij et al., 2015). Our findings fit well with the previously published prevalence proportions of burnout-related symptoms in medical interns that ranged from 28 to 61% (Puthran et al., 2016; Silva et al., 2017; van Venrooij et al., 2015; Dyrbye et al., 2006, 2017; Wolf and Rosenstock, 2017; Fares et al., 2016; Seweryn et al., 2015; IsHak et al., 2013).

Risk factors identified in our analyses may help to better target primary and secondary preventive action against burnout-related symptoms. Previous studies have identified some effective interventions. A systematic review of 13 controlled trials has demonstrated that there are few high quality studies, resulting in evidence for a few strategies like mindfulness-based stress reduction, meditation and pass/fail grading - in which study results are documented and presented as ‘passed’ or ‘failed’, instead of using a grading system (Shiralkar et al., 2013). In 2014, a randomised clinical trial amongst physicians in the U.S. found evidence for a biweekly facilitated physician discussion, with sustained results 12 months after the study (West et al., 2014). This promising approach fits well with the risk factors identified in the present study, as both levels of depersonalisation and emotional exhaustion decreased and work dedication was found to increase due to the intervention. However, more research is necessary whether this approach is also beneficial when implemented among medical students. As dispositional optimism was the strongest correlate of burnout-related symptoms found in this study, a specific approach to enhancing optimism would potentially decrease the risk of burnout-related symptoms. Interventions like *Best-Possible-Self Mental Imagery* are promising, which may help to increase (long term) optimism (Blackwell et al., 2013). Motivation and encouragement of personal strengths related to dispositional optimism and work engagement during discussion groups may help to address this.

In the Netherlands, several initiatives that target risk factors for burnout-related symptoms have been taken. For example, the LUMC initiated a mentoring program for medical interns. Furthermore, the

Netherlands Association of Medical Education installed a nationwide workgroup which focuses on future health care professionals' well-being. These are two steps on the road to a sustainable workforce, in which job satisfaction is integrated in its working culture. However, there are still many steps to take.

Risk factors that have been identified in previous studies include, for example, experiencing a major illness, being on a rotation which requires being on call and psychiatric morbidity (only a risk factor for emotional exhaustion) (IsHak et al., 2009). This study also found several robust correlates of burnout-related symptoms. First, work pace and quantity were especially strongly associated with burnout-related symptoms and its dimension emotional exhaustion (Barilan et al., 2011). It is evidently hard to change the workload. Reducing intern working hours in the US has not prevented against adverse outcomes like depressive symptoms, poor general well-being, and medical errors (Sen et al., 2013). Furthermore, previous literature recommended that preventive and therapeutic action should mainly target personality trait-related factors and need for recovery, rather than work-related factors (van Venrooij et al., 2015). Second, the need for recovery was another strong risk factor of burnout-related symptoms. A large cross-sectional study among over 12,000 employees found that the need for recovery was higher in those suffering from burnout-related symptoms and found it to be a separate entity from fatigue (Jansen et al., 2002). Third, of the correlates found in our study, UWES-dedication and dispositional optimism were strongly associated with burnout-related symptoms. Engagement (scored on the UWES) was previously found to be protective against burnout-related symptoms (Demerouti et al., 2001; Backovic et al., 2012; Martini et al., 2004; Schaufeli and Bakker, 2003; Dyrbye et al., 2010; Jansen et al., 2002; Giltay et al., 2006; Schaufeli and van Dierendonck, 2000; Prins et al., 2010). In the present study, the dimension dedication (rather than vigour and absorption) was independently inversely associated with burnout-related symptoms. Dedication refers to being strongly involved in one's work and experiencing a sense of significance, enthusiasm, inspiration, pride, and challenge (Schaufeli and Bakker, 2003). Medical professionals and young doctors specifically are possibly prone to experiencing more dedication than the average employee, as a study among residents has shown (Prins et al., 2010). Fourth, besides a protective effect against depressive symptoms, dispositional optimism was inversely associated with burnout-related symptoms in various previous studies among academic staff (Giltay et al., 2006; Barkhuizen et al., 2014). The present study underlines this effect, supporting dispositional optimism as a personality trait that may protect against the development of burnout-related symptoms.

Strenghts and limitations

Our study contains several strengths, among which the response rate (61%), which is higher compared to other similar online questionnaires (van Holland et al., 2007; Cook et al., 2000; Tijdink et al., 2014). The multivariable analyses of the several potentially important factors, including positive psychology ones, allowed for a clear overview of the meaningful intrapersonal factors involved in burnout-related symptoms. Furthermore, combined with the results of the 2015 study, our study provides insight into the medical student population at the LUMC as a whole. Our findings should also be interpreted in the light of some limitations. First, we included solely medical interns from one of the eight academic medical centers in the Netherlands, so these findings are not necessarily generalisable to other university centres, nationally or internationally. Second, this study has a cross-sectional design, which cannot disentangle cause from effect. Third, we used self-report questionnaires which are inherently affected by a person's feelings at the time of filling out the questionnaire. Fourth, we presented data which were obtained in 2013, which one may consider as somewhat outdated. Fifth, while being an important risk factor for burnout and low work engagement (Schaufeli et al., 2017), the personality trait of neuroticism was not measured in this study (Bianchi et al., 2021). Sixth, as burnout prevalence data for other groups of Dutch medical interns are lacking in the literature, we could only compare our findings to those from different countries, which also found high prevalence rates (Shanafelt et al., 2015; Brazeau et al., 2014). Another study among Dutch medical interns on health behavior and care needs has shown similar demographics with regards to the gender distribution (67.4% female in our study vs. 70.3% in their study), but differed with regards to ethnicity (93.0% has Dutch as their native language vs. 79.4% being native in their study) (Van der Veer et al., 2011). Finally, the CFA we have conducted on the UBOS showed that the fit of the domains to the model was not high in this population.

Conclusions

We conclude that prevalence of burnout-related symptoms was high among medical interns in this study, and associated with workload- and personality-related factors. In order to confirm these correlates as risk factors, prospective studies in which interns are followed during their rotations are needed. Identifying these risk factors may be important to develop effective (organisation-directed) interventions and preventive strategies in medical schools (Panagioti et al., 2017). By reducing seemingly highly prevalent burnout-related symptoms, these strategies ultimately aim at assisting young doctors to enjoy their work, build resilience, and develop a professional level of work engagement.

Research ethics and informed consent

The study was in accordance with the Declaration of Helsinki. A declaration of no objection was granted by the Institutional Ethics Review Board (ERB) of LUMC. This declaration means the Committee has only checked the research proposal in terms of completeness and the protection of the privacy of participating subjects. Furthermore, no persons were subjected to a treatment or were required to behave in a certain manner (ERB-identification number P13.078). All participants were asked to give informed consent online prior to filling in the questionnaire.

Declaration of Competing Interest

Conflict of interest: none.

Contributors

Erik Giltay, Jan van Lith, Daniëlle Eindhoven, Jill Mentink, Arnout Jan de Beaufort, Jacqueline Bustraan, Vivianne de Croon-Koevoets, Pieter Barnhoorn and Floor Tilmans contributed to the conception and design of the research. Floor Tilmans, Erik Giltay en Pieter Barnhoorn worked on the acquisition of the data, Lennard van Venrooij provided additional assistance with regard to analysis and interpretation of the data. Floor Tilmans and Lennard van Venrooij conducted literature searches and contributed to the writing of the manuscript. All authors commented on the manuscript regularly and have approved the final version.

Funding

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

Acknowledgments

None.

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Figure 1. Flowchart of participants (n=426)

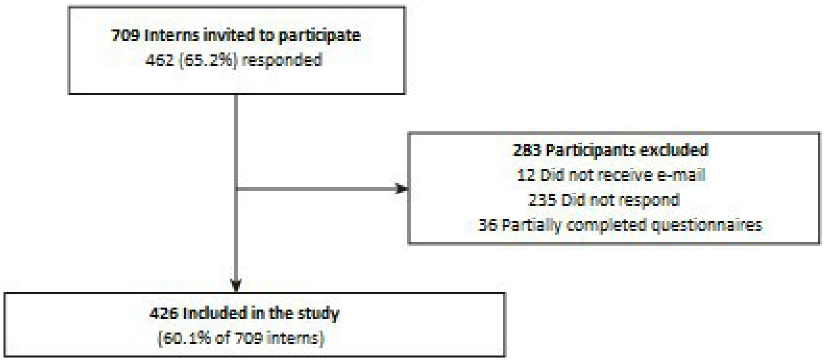
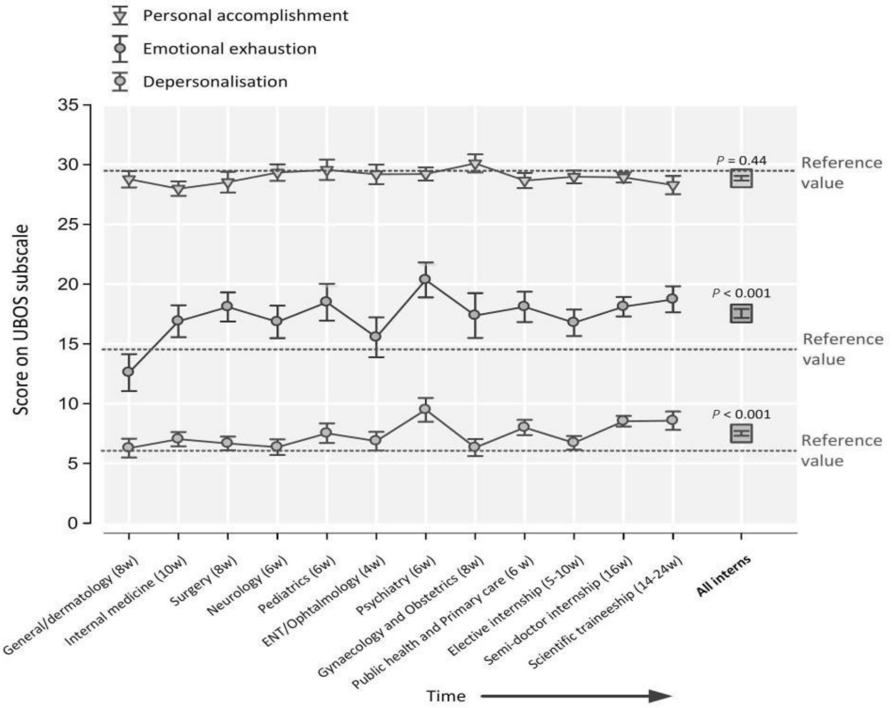


Figure 2. Burnout-subscale scores per internship and reference values in medical interns (n=426)[1]



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[1] Error bars represent standard errors. The reference lines were based on data from 10.552 Dutch health care employees (Schaufeli and van Dierendonck, 2000; Koppes et al., 2011).

Table I. The hierarchical solution from Omega analysis in R on the individual items of the UBOS

	UBOS domains and items	g	F1*	F2*	F3*	h2	u2	p2
	Emotional exhaustion:							
1.	I feel emotionally drained from my work	**0.29**	**0.77**			0.68	0.32	0.13
2.	I feel used up at the end of the workday	**0.27**	**0.72**			0.59	0.41	0.12
3.	I feel fatigued when I get up in the morning and have to face another day on the job		**0.65**			0.46	0.54	0.07
4.	Working with people all day is really a strain for me	**0.55**	**0.29**		0.29	0.51	0.49	0.61
5.	I feel burned out from my work	**0.38**	**0.76**			0.72	0.28	0.20
6.	I feel frustrated by my job	**0.41**	**0.57**			0.52	0.48	0.33
7.	I feel I am working too hard on my job	**0.23**	**0.42**			0.28	0.72	0.20
8.	I feel like I am at the end of my rope	**0.32**	**0.72**			0.63	0.37	0.16
	Depersonalisation:							
1.	I feel I treat some recipients as if they were impersonal objects	**0.34**			**0.24**	0.20	0.80	0.57
2.	I have become more callous toward people since I took this job	**0.46**	0.29		**0.31**	0.39	0.61	0.54
3.	I worry that this job is hardening me emotionally	**0.46**	0.42		**0.26**	0.45	0.55	0.46
4.	I don't really care what happens to some recipients	**0.41**			**0.31**	0.28	0.72	0.60
5.	I feel recipients blame me for some of their problems	**0.34**			**0.24**	0.20	0.80	0.57
	Personal accomplishment:							
1.	I can easily understand how my recipients feel about things	**0.41**	-0.21	**0.36**	0.25	0.41	0.59	0.42
2.	I deal very effectively with the problems of my recipients	**0.25**		**0.52**		0.34	0.66	0.18
3.	I feel I'm positively influencing other people's lives through my work	**0.26**		**0.53**		0.36	0.64	0.18
4.	I can easily create a relaxed atmosphere with my recipients	**0.41**	-0.21	**0.36**	0.25	0.41	0.59	0.42
5.	I feel exhilarated after working closely with my recipients	**0.41**		**0.53**		0.46	0.54	0.37
6.	I have accomplished many worthwhile things in this job	**0.33**		**0.49**		0.36	0.64	0.29
7.	In my work, I deal with emotional problems very calmly	**0.21**		**0.32**		0.18	0.82	0.24

^{*s}Schmid Leiman Factor loadings greater than 0.2 are given. The total Omega was 0.90 and the Cronbach's alpha was 0.87. Items from the Personal accomplishment domain were reverse coded. The h2 refers to the amount of variance in the item explained by the (retained) factors (i.e., communality), and the u2 refers to 1 - h2 (i.e., residual variance, uniqueness).

Table II. Confirmatory factor analysis (CFA) of the UBOS items

	UBOS domains and items	Estimate	Standard Error	z-value	p-value
	Emotional exhaustion:				
1.	I feel emotionally drained from my work	1.000			
2.	I feel used up at the end of the workday	0.998	0.056	17.914	0.000
3.	I feel fatigued when I get up in the morning and have to face another day on the job	0.817	0.058	14.206	0.000
4.	Working with people all day is really a strain for me	0.634	0.057	11.122	0.000
5.	I feel burned out from my work	1.148	0.055	21.056	0.000
6.	I feel frustrated by my job	0.910	0.059	15.523	0.000
7.	I feel I am working too hard on my job	0.623	0.064	9.773	0.000
8.	I feel like I am at the end of my rope	1.094	0.059	18.459	0.000
	Depersonalisation:				
1.	I feel I treat some recipients as if they were impersonal objects	1.000			
2.	I have become more callous toward people since I took this job	2.021	0.271	7.465	0.000
3.	I worry that this job is hardening me emotionally	2.139	0.282	7.581	0.000
4.	I don't really care what happens to some recipients	0.951	0.163	5.837	0.000
5.	I feel recipients blame me for some of their problems	0.986	0.168	5.870	0.000
	Personal accomplishment:				
1.	I can easily understand how my recipients feel about things	1.000			
2.	I deal very effectively with the problems of my recipients	0.995	0.127	7.837	0.000
3.	I feel I'm positively influencing other people's lives through my work	1.434	0.178	8.073	0.000
4.	I can easily create a relaxed atmosphere with my recipients	1.334	0.151	8.832	0.000
5.	I feel exhilarated after working closely with my recipients	1.541	0.168	9.177	0.000
6.	I have accomplished many worthwhile things in this job	1.537	0.180	8.548	0.000
7.	In my work, I deal with emotional problems very calmly	0.961	0.157	6.107	0.000

Comparative Fit Index (CFI) = 0.848; Tucker-Lewis Index (TLI) = 0.828; RMSEA = 0.081 (90%CI: 0.074 – 0.088), SRMR 0.08

Table III. Characteristics of medical interns (n=426)

Variable	**Data**
Socio-demographic variables	
Female sex – n (%)	287 (67.4)
Age, year – mean±SD	24.1±2.1
Age, year – range (IQR)	20–38 (22.8–24.8)
Total duration of internships, months – mean±SD	13.6±8.6
Partnership status – n (%)	
Single	164 (38.5)
Living alone, having a partner	144 (33.8)
Married or living together with partner	118 (27.7)
Housing situation – n (%)	
With parents	38 (8.9)
Student housing (shared facilities)	157 (36.9)
Private housing (own facilities)	231 (54.2)
Having no children – n (%)	419 (98.4)
Native language Dutch – n (%)	396 (93.0)
Possible correlates for burnout-related symptoms	
Working hours – mean±SD	53.5 (16.8)
Hours of sleep per night – mean±SD	6.87 (0.80)
High amount of sleep loss due to internship[1] – n (%)	67 (15.7)
Poor self-rated physical health[2] – n (%)	110 (25.8)
Poor self-rated mental health[2] – n (%)	107 (25.1)
Sick leave days in past year – mean±SD	3.21±4.72
Ten or more sick leave days in past year – n (%)	51 (12.0)
Happiness (0-10) – mean±SD	7.43±1.40

SD, Standard deviation; IQR, interquartile range.

[1] High amount of sleep loss was defined as a score (on a Likert scale from 1 to 5) of equal to or above 4.

[2] Low self-rated physical or mental health was defined as a score (on a Likert scale from 1 to 5) of equal to or below 2.

Table IV. Comparisons between 426 medical interns with and without burnout-related symptoms (n=426)

	Univariate			Multivariate		
	No burnout (n=296)	**Burnout (n=130)**	**P-value**	**OR (95% CI)**	**P-value**	**Wald (df)**
Socio-demographic variables						
Female sex - n (%)	196 (66.2)	91 (70.0)	0.44			
Age, year – mean±SE	24.1±0.13	24.2±0.19	0.91			
Total duration of internships (years) – mean±SE	1.13±0.04	1.16±0.06	0.71			
Partnership status – n (%)						
Single	117 (39.5)	47 (36.2)	0.50			
Living alone, having a partner	102 (34.5)	42 (32.3)				
Married or living together with partner	77 (26.0)	41 (31.5)				
Housing situation - n (%)						
With parents	22 (7.40)	16 (12.3)	0.26			
Student housing (shared facilities)	112 (37.8)	45 (34.6)				
Private housing (own facilities)	162 (54.7)	69 (53.1)				
Having no children – n (%)	292 (98.6)	127 (97.7)	0.48			
Native language Dutch – n (%)	279 (94.3)	117 (90.0)	0.11			
Possible correlates for burnout-related symptoms						
Working hours – mean±SE	52.5±0.96	55.8±1.56	0.06	1.01 (0.99-1.03)	0.49	0.48 (1)
Hours of sleep per night – mean±SE	6.90±0.05	6.81±0.07	0.33			
High amount of sleep loss due to internship[1] – n (%)	**32 (10.8)**	**35 (26.9)**	**<0.001**	1.14 (0.50-2.58)	0.75	0.10 (1)
Poor self-rated physical health[2] – n (%)	**49 (16.6)**	**61 (46.9)**	**<0.001**	1.94 (0.98-3.84)	0.06	3.66 (1)
Poor self-rated mental health[2] – n (%)	**44 (14.9)**	**63 (48.5)**	**<0.001**	1.02 (0.50-2.08)	0.95	0.003 (1)
Days off sick in past year – mean±SE	**2.74±0.24**	**5.74±0.50**	**0.002**	0.98 (0.89-1.09)	0.73	0.12 (1)
Ten or more sick leave days in past year – n (%)	31 (10.5)	20 (15.4)	0.15			
Utrecht Work Engagement Scale (UWES)						
UWES Vigour – mean±SE	**3.88±0.04**	**3.06±0.07**	**<0.001**	0.95 (0.53-1.70)	0.86	0.03 (1)
UWES Dedication – mean±SE	**4.44±0.04**	**3.72±0.07**	**<0.001**	**0.45 (0.26-0.79)**	**0.006**	**7.63 (1)**
UWES Absorption – mean±SE	**3.99±0.05**	**3.44±0.07**	**<0.001**	0.78 (0.48-1.29)	0.33	0.93 (1)
Work pace and quantity score (0-100)[3]– mean±SE	**37.6±0.79**	**48.4±1.19**	**<0.001**	**1.03 (1.01-1.06)**	**0.007**	**7.28 (1)**
Need for recovery score (0-100)[4] – mean±SE	**36.8±1.51**	**71.3±2.11**	**<0.001**	**1.04 (1.02-1.05)**	**<0.001**	**26.67 (1)**
Happiness score (0-10) – mean±SE	**7.86±0.06**	**6.45±0.14**	**<0.001**	0.77 (0.59-1.00)	0.05	3.76 (1)
Optimism (LOT-R) score (0-24)[5] – mean±SE	**17.2±0.19**	**14.1±0.31**	**<0.001**	**0.86 (0.78-0.95)**	**0.002**	**9.71 (1)**

Bold items are statistically significant at a α<0.05; OR, Odds ratio; 95% CI, 95% confidence interval; SE, standard error of mean.

[1] High amount of sleep loss was defined as a score (on a Likert scale from 1 to 5) of equal to or above 4.

[2] Poor self-rated physical or mental health was defined as a score (on a Likert scale from 1 to 5) of equal to or below 2.

[3] Work pace and quantity score (0-100): higher score, the greater the work pace and quantity.

[4] NFR score (0-100): the greater the score, the higher the need for recovery after a working day.

[5] Optimism (LOT-R) score (0-24): the higher the score, the more positive one's attitude in life is.


6

Chapter 6 - General discussion

In this thesis we aimed to answer the main question: 'How do GPs decide on child and youth mental health problems and what is the influence of their (lived) experience regarding mental health problems on this decision?' by answering four subquestions through four studies. In this general discussion, we first describe the main findings of this thesis. Next, we present points of discussion based on the findings and the literature. Then, we elaborate on strengths and limitations of the studies in this thesis. Subsequently, we provide clinical and research implications. Finally, we present our conclusion.

Summary of the studies

Article 1 focused on the subquestion 'how do GPs make decisions regarding psychosocial problems in children and youths?' by using a mixed method design (interviews and online survey). This small-sized vignette study describing three cases of children with mental health problems showed three domains of CDM mechanisms: 1) related to the GP, 2) the child and its social context, and 3) the GPs' collaboration with other youth care providers. GP-related mechanisms were GPs' primary approach of the problem (somatically or psychosocially) and their self-assessed competence to solve the problem based on interest in and knowledge about youth mental health care. Mechanisms related to the child and its social context included GPs' assessment of psychiatric (co)morbidity in the child, their sense of self-limitedness of the symptoms of the child and their assessed complexity of the problem. How GPs' experienced collaborating with youth care providers and if they had specific collaboration agreements with these providers were collaboration-related mechanisms.

Article 2 was directed at the subquestion 'can GPs' decisions on child and youth mental health problems be supported by means of a decision-support method?' by using a literature search to retrieve studies that involved CDM support methods (CDSMs) for GPs' CDM regarding mental health problems among children and youths. This review yielded fourteen studies on computer-based decision support methods, nine studies on telecommunication methods and two studies on support methods with features matching both computer-based decision support methods and telecommunication methods. These studies used a variety of study designs, e.g. observational, comparative and validation study designs. Identified CDSMs had varying functionalities, e.g. assistance in probable diagnoses and treatment/referral suggestions. Studies describing computer-based methods had better quality compared to studies describing other methods. Some clinical effects of CDSMs were described, e.g. improved screening and referral rates, and reduction in psychological distress. The review provided information on the implementation of CDSMs into general practice, considerations for GPs when choosing a CDSM (such as GP and practice characteristics) and possible ways in which CDSMs support GPs´ CDM.

Article 3 addressed the subquestion 'do doctors-to-be, among whom future GPs, have (lived) experience regarding mental health problems?' by using self-report questionnaires to measure burnout, depression- and anxiety-related symptoms among preclinical medical students of the Leiden University Medical Center. Factors related to personality traits and mental state have been measured by means of self-report questionnaires, such as emotional vitality and dispositional optimism. This cross-sectional survey in 433 preclinical medical students showed that 46.0% of the students reported symptoms indicative of burnout, 27.0% of depression and 29.1% of anxiety. The multivariate analyses showed independent correlates for self-reported symptoms indicative of adverse affective states.

Burnout-related symptoms were positively correlated with <6 h sleep per night and need for recovery, and negatively correlated with happiness. Depressive and anxiety-related symptoms were negatively correlated with optimism and happiness, and positively correlated with high need for recovery. The conclusion is that the prevalence for adverse affective states was high among preclinical medical students and mainly associated with factors related to personality trait and mental state, and need for recovery.

Article 4 aimed at answering, in a group of medical interns, the subquestion ‘do doctors-to-be, among whom future GPs, have (lived) experience regarding mental health problems?’ Factors related to personality traits and mental state, such as engagement and dispositional optimism, were measured using questionnaires – additionally to other factors. This cross-sectional survey showed that 31% of medical interns studied fulfilled the criteria for moderate to severe burnout-related symptoms, with among them 4% fulfilling the criteria for severe symptoms indicative of burnout. Mainly increased emotional exhaustion and, to a lesser extent, increased depersonalisation were the dimensions of burnout most affected. The independent correlates we found suggested that there are risk factors and protective factors involved. The multivariate analysis of these factors showed high work pace and quantity, low dedication, high need for recovery, and low dispositional optimism to be the independent risk factors for burnout-related symptoms. The article concludes that the prevalence of burnout-related symptoms was high among medical interns in this study, and associated with workload- and, possibly, factors related to personality traits and mental state.

Points of discussion

Below, several issues are discussed based on the findings of this thesis and the literature. Successively, we discuss different types of decision-making among GPs, implementation of decision-support methods into GPs’ way of working regarding child and youth mental health problems, and mental health problem-related symptoms among doctors-to-be (among whom future GPs).

Different types of decision-making among GPs

Our findings show that different modes of decision-making in GPs on mental health problems in children and youths are employed. GPs differ in how they approach a problem of a patient (physically v.s. psychosocially), in their capability to recognize and manage psychosocial problems, as well as their willingness to take up youth-care related tasks. GPs' focus on disease reflects a doctor-centered model, while GPs who focus on quality of life reflect a more patient-centered model (McWhinney, 1985). Our findings suggest three role archetypes GPs may fulfil in their CDM, as previously described by Roberts 2014: 'fixers', 'future planners' and 'collaborators' (Roberts et al., 2014). In our study, GPs who would choose for an immediate referral might be prone to 'fix' the problem straightaway, similar to GPs who primarily considered (generally more tangible and uncomplicated) physical causes. Previous literature suggest this immediate referral might be due to uncertainty about a diagnosis (Koposov et al., 2017). It may be noteworthy that, in our study, GPs who worked longer as a GP seemed also to prefer a somatic approach of psychosocial problems, possibly because current medical training adopts a stronger focus on the patient in their social context compared to earlier training (Roberts et al., 2014; Martinez et al., 2006). Some GPs we have studied may be described as future planners, i.e. GPs who considered cause(s) related to the child and its social context at first, as well as GPs who decided to understand and to solve the problem by themselves – instead of referring their patient to secondary mental health care. These GPs seemed more prone to display shared decision-making, which has been shown to improve behavioural health outcomes in children and increase parent satisfaction (Fiks and Jimenez, 2010). Collaborators, also possibly identifiable in this thesis, were seemingly similar to future planners with regards to their shared-decision approach, as they appeared eager to contact multiple informants (e.g. parents, but also institutions like school) to gain knowledge about the problem situation. They may have differed from other archetypes, however, in that they seemed more likely to have existing collaboration agreements with youth care providers (Roberts et al., 2014).

Collaborative decision-making in the Dutch youth care system since 2015

In the Dutch youth care system per 2015, municipalities have the responsibility for establishing interdisciplinary collaborations between GPs, (local) youth care providers and themselves (VNG, 2022). At first view, this regulation may appeal on GPs identifying themselves as collaborators and, as one might suggest, raise the need for shifting towards more collaborative decision-making among GPs preferring other archetypes (Roberts et al., 2014). However, such a shift might pose some challenges, since health insurance-funded GPs are funded differently for youth care-related tasks compared to other municipality-funded youth care providers. In current form of financing, some GPs may prioritize holding on to traditional ways of working regarding youth care-related tasks, instead of trying new collaborative initiatives – e.g. integrating health care psychologists into general practice and collaborating with local youth teams. One might feel this is a missed opportunity, as local collaborative initiatives have shown promising results regarding availability of child mental health services (VNG, 2022). Therefore, municipalities may want to look for possibilities for financing GPs for youth care-related tasks in the same way compared to other youth care providers, by collaborating with health insurers. Other considerations for improving interdisciplinary collaboration include municipalities and youth care providers taking the first step towards GPs by acquiring knowledge of their competencies and tasks, and by optimizing information exchange (Koning et al., 2018). Also, as many GPs report to receive insufficient resources to carry out their tasks, as illustrated by their mild support for a new national interdisciplinary collaboration agreement, municipalities may gain GPs' trust by attentive one-on-one with or public talks by municipal workers on what they need to help children and adolescents properly, e.g. more time per consultation or money for personnel. Because GPs often have busy time schedules, municipalities might want to consider financing GPs or a representative of their general practice for the extra time they invested to attend such talks. Another option would be to offer accreditation points, mandatory for re-registration as a GP (Koning et al., 2018; Rijksinstituut voor Volksgezondheid en Milieu, 2022). As for these considerations, one could argue the patient's interest should have main priority, as primary care is expected to be increasingly focused on supplying societal demands in the future (Raad Volksgezondheid & Samenleving, 2023).

Implementation of CDSMs for child and youth mental health problems into general practice

CDSMs for GPs ideally ensure accurate and timely detection of child mental health problems and appropriate referral, in order to prevent the long-term consequences of these problems (Koposov et al., 2017; Roberts et al., 2014). However, one should take the implementation into account, as our mixed method study suggest GPs differ in their way of working. Therefore, a degree of user flexibility for both provider and patient is recommended when implementing a CDSM; e.g. with regards to understandability and ease of use (Cheng et al., 2017). It is advised GPs are made aware of their considerations regarding their choice of CDSM. Our thesis implies these considerations should be related to the context they work in, such as where their general practice is located (e.g. located in a neighbourhood with young families or in a city center, distance to youth care providers and other facilities), size of their general practice (e.g. number of staff, number of paediatric patients), whether GPs already use CDSMs (e.g. an integrated service in which additional consultations with youth mental health specialists can be requested by the GP) or whether they already have collaboration agreements with youth care providers (e.g. psychologists from a youth and family center who visit the general practice on a regular basis to see paediatric patients), as well as their own attitude and knowledge on mental health problems among children and youths (e.g. way of organizing the consultation, previous education of the GP in this area, as well as having (lived) experience regarding mental health problems themselves) (Verhaak et al., 2015). In the Dutch situation, multiple CDSMs have been implemented over the past years since 2015, most of them focusing on collaboration agreements between GPs and mental health nurse practitioners specialized in youth care (VNG, 2022). Some of the CDSMs focus on direct collaboration agreements between GPs and preventive youth healthcare physicians, others on appointing youth mental health specialists at preventive services –

such as general practices (Koning et al., 2018; Theunissen et al., 2018). Up to now, in the Netherlands, no known CDSMs have been implemented which provide electronic support; e.g.by using electronic health records or generating algorithmic advice on diagnosis and referrals. One could advocate such CDSMs, as first monitoring observations point towards less referrals to secondary mental health care, increased engagement of GPs in youth care-related tasks, broadening of expertise in general practice, patient satisfaction, less perceived stigma by patients and improved interdisciplinary collaboration compared to care as usual. However, before being valuable in its contribution to the timely recognition of child mental health problems, electronic health records should be improved by facilitating accurate recording and increasing the proportion of data that can be entered through forms of structured input (Koning, 2021). Furthermore, while electronic CDSMs seemingly induce less referrals to secondary mental health care, other initiatives such as integrated care models may have additional benefits as they lead to a shift to primary mental healthcare. However, integrated care models may also increase detection rates (Verhaak, 2015).

When implementing a CDSM, the literature suggests several points of attention directed at person(s) regulating the CDSM implementation, e.g. with regards to establishing engagement among primary care providers and management leaders through communication and support (Jeffries et al., 2021). When implementing a CDSM, the literature suggests several points of attention. In general, as any new method, implementing CDSMs into general practice takes time and effort. When implementing, one may roughly shift through the following stages, i.e. exploration (e.g. preparations for implementation), installation (e.g. securing and developing the support needed to put a CDSM into place as intended), initial implementation (e.g. trying out the CDSM and getting better in implementation) and full implementation (e.g. skilfully using a CDSM that is well-integrated into GPs' repertoire) (National Implementation Research Network, 2023). Applied to child and adolescent mental health problems in primary care, one could opine it is important to devise these implementation phases in advance (e.g. by formulating question framework to inventory needs and wants) and to prepare for unexpected situations during the implementation (e.g. by providing telephone numbers of the person(s) regulating the CDSM implementation when practical questions emerge). Furthermore, it would be advisable to make an implementation plan collaboratively with GPs, mental health nurse practitioners, staff members, secretaries and other key players to adjust the implementation process to the GP, their patients and their way of working in their general practice. Lastly, one could recommend frequent contact moments with these key members to monitor the outcomes of interest.

Functionalities of CDSMs: need for multi informant-based methods

As can be found in the literature, there are many CDSMs for GPs with varying functionalities; which should be tuned to the way of working and desired effects (Sutton et al., 2020). Best practices in youth mental health assessment involve soliciting reports from multiple informants, such as the child itself and its parents/caregivers (Charamut et al., 2003). Most CDSMs found in the systematic review of this thesis meet this recommendation. For example, the Development and Well-Being Assessment, which requires input from children, their parents/caregivers and their teacher, has been shown to provide the feature for a shared language between primary care and specialized care professionals and parents, as well as having favorable diagnostic characteristics (Goodman et al., 2000; Aydin et al., 2022). To the best of our knowledge, based on our systematic review, a few multi informant-based CDSMs have been (fully) implemented into general practice, examples include MyGRaCE, CHICA, Mobiletype, Youth StepCare, Consultation-liason method (between GPs and psychiatrists), telepsychiatry consultation practice and the MC3 Program. While multi informant-based CDSMs seem promising with regards to improved shared understanding of mental health risk between patients and GPs, GPs' knowledge and confidence while managing mental health problems (e.g. prescribing and monitoring of psychotropics and improved access to mental health care), increased detection rates, positive impact on communication and user satisfaction; they were reported to be somewhat overwhelming and confusing to patients. Therefore, it is recommendable GPs think carefully about how to engage children, youths and their parents into using the CDSM, as it might be already challenging to involve minors into making decisions about their mental health when no CDSM is involved. It is suggested GPs should determine the extent to which children are able to participate in the decision-making process based on a case-by-case basis, taking into consideration factors related to the child, parents, sociocultural context and factors related to themselves. For factors related to the child, GPs could benefit from having knowledge on cognitive, emotional and social development of children and youths, being aware of the (often nationally organized) legal recognition of children's right to participation and comprehending a child's previous disease experience in cooperation with the child and its parents. For parent-related factors, GPs should be made aware that, traditionally, parents are viewed as the key decision-makers on behalf of their children. However, in cases of serious harm of their child, these decisions may be overridden by the GP. One may suggest GPs should be aware that parents can feel excessively responsible for their children's behaviours and actions, which can lead to wanting to have full disclosure of all (non-) health-related information and protecting the child or youth from (supposedly) irresponsible decisions. In such cases, it might be a challenge for GPs to confer with parents, as overprotectiveness may not be in the child's best interest (e.g. by inducing fear and anxiety in the child). With regards to factors related to the sociocultural context, GPs might benefit from being thoughtful of the sociocultural context of the child and its family, i.e. with regards to family interactions, parental responsibility and authority – as it may also influence children's participation in decision-making. For factors related to GPs themselves, it is suggested GPs should be conscious about possible own ineffective verbal and non-verbal communication skills, an overuse of medical jargon, possible own beliefs that children are not mature and therefore in need of protection and more practical factors which may prevent children's participation in the decision-making process - such as GPs' lack of time for explanations or discussions with the child (Jeremic et al., 2016).

Mental health problems among doctors(-to-be) and possible implications

Our findings suggest that symptoms of mental health problems are prevalent in Dutch doctors-to-be and that many graduated doctors, such as GPs, have (had) such symptoms. While the prevalence of mental health disorders, such as anxiety disorder, depressive disorder and alcohol addiction, has increased strongly over the past decade in the general youth and adult population, doctors-to-be are shown to have even higher rates - also compared with other professional groups (Trimbos instituut, 2022). As anyone, doctors-to-be are exposed to overburdening because of school/work, others' opinions (facilitated by social media), personal problems, troubles at home and worries about world issues; e.g. climate change and the corona pandemic (Trimbos instituut, 2022; Rijksinstituut voor Volksgezondheid en Milieu, 2022; Peng et al., 2023; Nederlands Jeugdinstituut, 2021). However, doctors-to-be are particularly at risk, because they are chosen for personality traits that predict responsible doctoring, such as perfectionism and obsessiveness. Starting from early education, doctors-to-be are driven, competitive, compulsive, individualistic and ambitious (Gerada, 2018). It is suggested that these extensively expressed features may counteract towards doctors-to-be when stressed and may lead to mental health problems, as our results seemingly show: doctors-to-be were generally unhappy, unoptimistic, had low dedication, slept <6 hours per night, had a high need for recovery and a high work pace & quantity. After finishing medical school, doctors have apparently protective factors for developing mental health problems, including career and financial security, high status and a generally rewarding job. However, they also have additional risk factors over factors who apply to anyone (e.g. genetic predisposition, early traumatic life events, later bereavements, illnesses and relationship breakdowns), such as difficult working environments and encounters with death (Gerada, 2018; Elliott et al., 2010). Excessive stress in medical training can break the stability of the doctors'(-to-be) health and result in illness, such as headaches, gastrointestinal disorders, coronary heart disease, self-medication, mental health disorders and, in some cases, suicide (Gerada, 2018). Furthermore, if not recognized and addressed during medical training, (lived) experience regarding mental health problems may impact doctors'(-to-be) professionalism, such as having difficulties in solving interpersonal conflicts, having decreased attention, reduced concentration, loss of objectivity, increased incidence of errors, and improper behaviour such as negligence (Zerubavel and Wright, 2012; Rotenstein et al., 2016). These problems may also negatively influence their own sense of identity as a doctor, especially through depression, as illustrated by doctors who feel guilty because they may find it difficult to fall short providing adequate care (Gerada, 2018; Rotenstein et al., 2016). Lastly, having (lived) experience with mental health disorders may influence doctors' attitude towards mental health problems in their patients, which impacts their doctor-patient relationship through compassion fatigue, overidentification, projection and doctors having a personal agenda. However, some advantages of having (lived) experience have also been described, such as improved empathy and patient satisfaction (Zerubavel and Wright, 2012).

Strengths and limitations regarding the studies in this thesis

This thesis contains multiple strengths. We used qualitative and quantitative study methodologies and study materials for answering the subquestions of this thesis. We believe the studies of this thesis contribute to relatively unexplored research areas regarding GPs' decision-making and provide valuable insight into existing literature. Furthermore, the articles have been written with a practical scope, so our recommendations may be useful for readers working in the fields of study.

This thesis also have some limitations. First, the vignette studies about decision-making included a small sample of GPs, so we are not able to generalize our findings. However, the quantitative data confirmed multiple findings from the qualitative study, which strengthens the reliability of our findings (Venrooij, 2022). Moreover, our findings were in line with the (relatively scarce) literature, e.g. a tendency for a somatic approach among experienced GPs, GPs' sufficient self-perceived competence possibly leading to more thought-out CDM, GPs' refraining from referring to a youth health care provider in case of negative collaboration experiences and the importance of interprofessional collaboration in enhancing the effectiveness of health services offered to the public. Second, there was a possibility of self-selection bias in our studies. Medical students and interns with adverse affective states might have been more prone to participating in the questionnaire study on mental health problems, the same applies for GPs participating in the vignette study; who may have been more interested in youth mental health care. Self-selection bias might have made the study samples unrepresentative of the populations of interest and might have decreased the external validity of our findings, as individuals might be overrepresented who have strong opinions. However, to avoid self-selection bias as much as possible, we tried to reach all doctors-to-be by various ways of recruitment and GPs by actively contacting their general practices (Nikolopoulou, 2022). Third, the interpretation of results of the cross-sectional questionnaire studies was somewhat impeded, because these studies were conducted in one university, because cause and effect could not be disentangled and because of reduced statistical power (dichotomized continuous variables). However, our findings were comparable to similar research, which supports the relevance of our results.

Recommendations for future actions

Clinical implications

This thesis has several implications for clinical practice. First, it suggests GPs have different styles of decision-making and that there are many factors influencing their decision-making process, among which having (lived) experience with regards to mental health disorders. Therefore, GPs should have the opportunity to choose a CDSM which matches their personal style of decision-making. The systematic review of this thesis shows that many different CDSMs exist from which GPs can choose. GPs choosing a

CDSM matching their way of decision-making may facilitate the implementation of the CDSM into general practice and makes it more likely the GP can retrieve their benefits, such as referral accuracy, and subsequently, cost-efficiency with regards to triage (VNG, 2022; Kolko et al., 2014; Asarnow et al., 2015). However, as one might opine, GPs' interests regarding their choice for a CDSM should be questioned, as primary attention should be paid to the benefits for the child and its family, such as whether the CDSM is usable, valid and trustworthy. Also, one could suggest to strive for more standardization, i.e. GPs using the same CDSM or providing them the opportunity to choose from a small selection of CDSMs, in order to decrease subjectivity and increase objectivity (e.g. to enhance interdisciplinary collaboration). To assist GPs in their decision-making and, consequently, which CDSM to choose, it is recommendable GPs are made aware of possible factors which influence their decision-making. Also, it is recommendable to teach them this process is likely both objective and subjective, which poses an important opportunity for medical education and continued training. This thesis suggests that the objective part of decision-making includes teaching doctors(-to-be) about normal and divergent development of children and youths, as well as giving GPs practical information about CDSMs. The subjective part of decision-making comprises doctors'(-to-be) insight into their possible implicit bias (e.g. norms and values), a bias that occurs automatically and unintentionally, that nevertheless affects judgments, decisions, and behaviors – and therefore possibly requires support by a CDSM (National Institutes of Health, 2023). Additionally, an important question could be about their own experience with mental health problems, as this can influence how they deal with patients having similar struggles (Anshu and Singh, 2017).

Previous literature argue universities have the task to identify students who are suffering from long lasting untreated mental health disorders, not to be confused with students who temporarily experience psychological distress because of the subject taught (e.g. human cadaveric dissection) (Kihumuro, 2022). Ways to fulfill this task include educating medical students about mental health and well-being, providing low-threshold mental health support and sustaining a proactive (e.g. targeted messaging) - not reactive - approach to mental health; as many students do not seek care (Kihumuro, 2022). Furthermore, in medical education, it is suggested that attention should be paid to stigmatization, as it may contribute to symptom concealment and poses a barrier to accessing mental health services, together with medical students' lack of time (Phillips, 2022). Possible solutions include creating a low-stigma environment, e.g. organizing a Coming Out Proud with mental health illness or to employ less labeling and more descriptive language when discussing students' behaviour (e.g. 'dreamy' instead of 'psychotic') – while still acknowledging the clinical necessity of psychiatric terminology (Hankir, 2014; Gray, 2002). Departments of psychiatry may have an important role in organizing appropriate mental health services and supporting medical students to develop and utilize functional and effective coping strategies. Furthermore, as these are the departments with growing expertise, they might be designated to facilitate the debate between faculty staff and medical students on what defines responsible doctoring and feasible ways to substantiate this concept.

Research implications

As this thesis provides some information on GPs' decision-making regarding detecting and managing mental health problems in children and youths and methods to support them, this thesis may inspire further research on decision-making of doctors in other medical disciplines – focusing on other types of patients and medical problems. As for CDSMs for mental health problems in children and youths, longitudinal research is needed on their diagnostic accuracy, predictive value and cost-efficiency. The studies in this thesis suggest that (lived) experience regarding mental health problems is prevalent in doctors-to-be. Therefore, it might be clinically relevant to investigate the prevalence of these problems in graduated doctors (such as GPs), as well as possible effects of their (lived) experience on their way of working and their contacts with patients. Additional to more studies on preventive and interventive actions, longitudinal research is recommended on the impact of doctors' (lived) experience on their personality development and, consequently, their identity as a doctor (Straussner et al., 2018; Zerubavel and Wright, 2012). In this process of growth, reflection of one's own thoughts and actions in medical education and continuous training, together with others, might be helpful as it is shown to be beneficial when for example enhancing learning of complex subjects, deepening professional values and improve attitudes and comfort when learners explore difficult subjects. However, further research is needed to understand how reflection can influence growth in professional capacities and patient-level outcomes in ways that can be measured (Winkel et al., 2017).

Conclusion

Mental health problems among children and youths are common and GPs play an important role in their early detection and management. This thesis suggests their CDM is influenced by the child and its social context, their collaboration with youth care providers, but also with factors related to themselves. The latter may include their view on child and youth mental health disorders, which influence how they make decisions (e.g. if and how they use CDSMs) and - possibly - if they have (lived) expertise regarding mental health problems. The high prevalences of symptoms and their correlates among doctors-to-be give rise for discussion on the importance of doctors'(-to-be) choices regarding what they need and want in both leisure and work, as well as raising and educating them to become balanced individuals who display responsible behaviour towards themselves and others within professional frameworks.

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Chapter 7 – Appendices

English summary

Mental health problems among children and youths are common and have numerous negative consequences for young people and their social network. Therewith, these problems pose a social issue. GPs play an important role in early detection and management of these problems. Insight into their clinical decision-making and, as a result, way of working would be helpful to develop methods for providing children and youths with the help they need. Previous literature suggest many doctors(-to-be), of whom some are or will become GPs, have (lived) experience related to mental health problems themselves. Previous studies also suggest having (lived) experience influences GPs' clinical decision-making, and consequently their way of working. It would have clinical benefits for GPs and patients to explore this process.

This thesis is constructed of four different articles, each contributing to answering the main question: **'How do GPs decide on child and youth mental health problems and what is the influence of their (lived) experience regarding these problems on this decision?'**

Article 1: How do GPs make decisions regarding mental health problems in children and youths?
For answering this subquestion, a *mixed methods* design was used: interviews among 14 and an online survey among 15 GPs. GPs were asked about their clinical decision-making process on children and youths with mental health problems using three vignettes describing children and youths with mental health problems representative of clinical practice. The findings suggest GPs differ with regards to their decision-making regarding child and youth mental health problems, and that their decision-making is influenced by factors related to 1) the GP, for example if the GP approaches the problem somatically or psychosocially, if the GP considers themself competent enough to solve the problem with regards to their interest in and knowledge about youth mental health care, 2) the child and its social context, for example if the child or youth has psychiatric (co)morbidity, if the problem is likely to solve itself and if the problem could be assessed as being complex and 3) the GPs' collaboration with other youth care providers, for example if GPs have existing collaboration agreements with these youth care providers and how they view their collaboration.

Article 2: Can GPs' decisions on child and youth mental health problems be supported by means of a decision-support method?
For answering this subquestion, a literature search was conducted to retrieve studies that involved clinical decision support methods for GPs' clinical decision-making related to mental health problems among children and youths. This systematic review yielded 25 studies on 18 clinical decision-support methods, divided into computer-based methods (such as *MyGRaCE*), telecommunication methods (such as *CAP* PC) and methods with a combination of components related to computer-based methods and telecommunication

methods (such as *Collaborative care for depression intervention*). The article provides insight into (possible) beneficial clinical implications of clinical decision-support methods. These methods could give more insight into possible mental health problems, they could provide structured information which can be used by the GP and/or parents during their next consultation with the child or youth, and they could also decrease time and costs spent by the primary care practice and the GP. There are also less beneficial clinical implications, such as an inability for some computer-based methods to be used in emergency situations, when time is short, problems for children and youths when using computer-based methods because of their mental status, and impediment to discuss certain topics freely because the decision-support method gives too much direction to the consultation. The article describes certain considerations for GPs when choosing a decision-support method, which may indirectly have a positive impact on the implementation of such methods into general practice. For example, the GP can take into account their way of working, user flexibility of the method for the GP, the child/youth and their parent(s) with regards to understandability and ease of use, if the GP already uses a clinical decision-support method, if the GP already has collaboration agreements with youth care providers, as well as their own attitude and knowledge regarding mental health problems among children and youths.

Article 3: Do doctors-to-be, among whom future GPs, have (lived) experience regarding mental health problems? Study focused on preclinical medical students.

For answering this subquestion, self-report questionnaires were sent to 1311 preclinical medical students of Leiden University Medical Center to measure burnout-, depression- and anxiety-related symptoms. The article concludes that symptoms related to mental health problems are common among preclinical medical students. Burnout-related symptoms were found in 46%, depression-related symptoms in 27% and anxiety-related symptoms in 29% of preclinical medical students. Burnout-related symptoms among preclinical medical students were correlated with a sleep duration of less than 6 hours per night, low happiness and a high need for recovery after a day of study. Depression- and anxiety-related symptoms were mainly correlated with low optimism, low happiness, and a high need for recovery after a day of study. These findings suggest preclinical medical students are at risk to develop mental health problems, which can inspire universities to come up with preventive interventions.

Article 4: Do doctors-to-be, among whom future GPs, have (lived) experience regarding mental health problems? Study focused on medical interns.

For answering this subquestion, self-report questionnaires were sent to 709 medical interns of the same institution mentioned in article 3 to measure burnout-related symptoms. Burnout-related symptoms were found in 30% of medical interns. Burnout-related symptoms among medical interns were related to low dedication with regards to work, a high work pace and quantity, a high need for recovery after a day of work and low optimism. These correlates could be used to prevent mental health problems among medical interns by making adjustments to the medical curriculum.

The articles of this thesis suggest GPs' decision-making on mental health problems in children and youths is multifactorial and consists of objective and subjective components. Furthermore, decision-making seems to differ between GPs, which may be an explanation why there are a variety of clinical decision support methods. Some clinical decision support methods have been implemented in the context of research into general practice, like MyGRaCE, *CHICA*, *Mobiletype*, *Youth StepCare*, *consultation-liason method* (between GPs and psychiatrists), *telepsychiatry consultation practice* and the *MC3 Program*. A clinical implication is GPs can choose a decision-support method which match their personal style of clinical decision-making. However, the validity, trustworthiness and usability of available methods need to be further explored. A clinical implication with regards to medical students' mental health comprises universities provide accessible proactive mental support to preclinical medical interns and medical interns, because many do not seek help themselves. Furthermore, universities could stimulate a stigma-reducing educational environment, for example in collaboration with the department of (Child- and Adolescent) Psychiatry. Therefore, medical students could be equipped with effective strategies to cope with mental health problems. Also, they might be made aware of their vulnerability, so that they may know their subjectivity and use their personal experiences in practice.

The results of this thesis invite more (longitudinal) research on the diagnostic precision, predictive value and cost-efficiency of clinical decision-support methods. Furthermore, more research is needed on the prevalence of mental health problems among graduated doctors, like GPs, and possible effects of these problems on their way of working, their decision-making and their contacts with patients. Strengths of this thesis include exploration of a relatively unknown research area, namely GPs' clinical decision-making regarding mental health problems among children and youths. Therefore, this thesis used multiple research methodologies and it used a practical scope. This thesis also contains several limitations, such as inclusion of a small GP population, as well as self-selection bias in the studies on preclinical medical students, medical interns and GPs. Finally, interpretation of the results of this thesis was impeded because the research has been conducted in one university, because cause and effect of results could not always be disentangled and because of low statistical *power*.

Because having mental health problems may influence GPs' clinical decision-making, one could explore how (future) doctors work, study and relax. Therefore, it is recommended to strive for educating balanced doctors: persons who, in collaboration with their colleagues, are – through reflection – aware of their needs and wants between professional boundaries.

Nederlandse samenvatting

Mentale gezondheidsproblemen onder kinderen en jongeren komen veel voor en hebben veel negatieve gevolgen voor jonge mensen en hun sociale netwerk. Daarmee vormen deze gezondheidsproblemen ook een maatschappelijk vraagstuk. Huisartsen hebben een belangrijke rol in de vroege herkenning van deze mentale problemen, alsmede het vroegtijdig handelen. Inzicht in hun klinische besluitvorming en hun hieruit voortkomende manier van werken kan helpen ondersteuningsmethoden te ontwikkelen om kinderen en jongeren tijdig de hulp te bieden die ze nodig hebben. Eerdere literatuur doet vermoeden dat veel (toekomstige) artsen en daarmee (toekomstige) huisartsen zelf mentale gezondheidsproblemen (hebben) ervaren. Eerdere studies suggereren ook dat het zelf (hebben) ervaren van mentale gezondheidsproblemen de klinische besluitvorming van de (huis)arts, en daarmee ook aan de manier van werken, beïnvloedt. Het zou klinische voordelen voor (huis)artsen en patiënten kunnen opleveren wanneer men dit proces zou exploreren.

Dit proefschrift bestaat uit vier verschillende artikelen, elk bijdragend aan het beantwoorden van de hoofdvraag:

‘Hoe maken huisartsen klinische beslissingen over mentale problemen bij kinderen en jongeren, en wat is de invloed van hun eigen ervaring ten aanzien van dergelijke problemen?’

Artikel 1: Hoe maken huisartsen (klinische) beslissingen over mentale problemen bij kinderen en jongeren?

Voor de beantwoording van deze deelvraag is een *mixed methods*-onderzoeksopzet gebruikt: interviews onder 14 en een online vragenlijst onder 15 huisartsen. De huisartsen werden gevraagd naar hun besluitvormingsproces bij kinderen met mentale problemen aan de hand van drie vignettes, waarin kinderen met mentale problemen beschreven worden die representatief zijn voor de dagelijkse praktijk van de huisarts. De bevindingen suggereren dat huisartsen verschillen met betrekking tot hun besluitvorming ten aanzien van mentale gezondheidsproblemen bij kinderen en jongeren, en dat de besluitvorming wordt beïnvloedt door factoren gerelateerd aan 1) de huisarts, onder andere of de huisarts het probleem somatisch of psychosociaal benadert, alsmede of de huisarts zichzelf competent genoeg acht om het probleem op te lossen afgaande op eigen interesse in en kennis over jeugdhulp, 2) het kind en diens sociale context, onder andere of het kind psychiatrische (co)morbiditeit heeft, of het probleem zich waarschijnlijk vanzelf zal oplossen en of het probleem als complex ingeschat wordt en 3) de samenwerking van de huisarts met andere jeugdhulpverleners, onder andere of huisartsen bestaande samenwerkingsafspraken hebben met jeugdhulpverleners en hoe ze deze samenwerking ervaren.

Artikel 2: Kan men de klinische besluitvorming van huisartsen ten aanzien van mentale problemen bij kinderen en jongeren ondersteunen met behulp van een ondersteuningsmethode?

Voor de beantwoording van deze deelvraag is een literatuurstudie verricht naar ondersteuningsmethoden voor huisartsen bij hun klinische besluitvorming als het gaat om mentale gezondheidsproblemen bij kinderen en jongeren. In het kader van deze systematische review zijn 25 studies gevonden naar 18 besluitvormingsondersteuningsmethoden, onderverdeeld in computergestuurde methoden (zoals de *MyGRaCE*), telecommunicatie-methoden (zoals de *CAP PC*) en methoden die bestaan uit een combinatie van computergestuurde en telecommunicatie-methoden (zoals de *Collaborative care for depression intervention*). Het artikel geeft inzage in (mogelijke) gunstige klinische implicaties van de gevonden besluitvormingsondersteuningsmethoden. Het kan meer inzage geven in mogelijke mentale problemen, gestructureerde informatie opleveren die door de huisarts en/of ouders kan worden gebruikt tijdens het volgende consult met het kind of de jongere, alsmede tijd en kosten voor de huisarts(enpraktijk) verminderen. Er zijn ook minder gunstige klinische implicaties; zoals het niet altijd kunnen inzetten van computergestuurde methoden in noodsituaties, wanneer de tijd schaars is, problemen met het gebruik van computergestuurde methoden door kinderen en jongeren vanwege hun mentale gesteldheid, alsmede een mogelijke belemmering van het vrijuit bespreken van problemen doordat de besluitvormingsondersteuningsmethode het consult te veel stuurt. Het artikel beschrijft enkele overwegingen voor huisartsen bij het kiezen van een besluitvormingsondersteuningsmethode, die indirect van positieve invloed kunnen zijn op de implementatie van dergelijke methoden in de huisartsenpraktijk. Zo kan bij de keuze rekening worden gehouden met de manier van werken van de huisarts, de gebruikersflexibiliteit voor zowel huisarts als het kind/jongere en diens ouder(s) met betrekking tot begrijpelijkheid en gebruiksgemak, of er reeds een besluitvormingsondersteuningsmethode door de huisarts wordt gebruikt, of de huisarts reeds samenwerkingsafspraken heeft met jeugdhulpverleners, alsook de attitude en kennis van de huisarts ten aanzien van mentale problemen onder kinderen en jongeren.

Artikel 3: Hebben (toekomstige) artsen, waaronder (toekomstige) huisartsen, zelf ervaring met mentale problemen? Studie gericht op preklinische geneeskundestudenten.

Voor de beantwoording van deze deelvraag zijn vragenlijsten uitgezet onder 1311 geneeskundestudenten van het Leids Universitair Medisch Centrum om burn-out-, depressie- en angstgerelateerde symptomen in kaart te brengen. Het artikel concludeert dat symptomen passend bij mentale gezondheidsproblemen regelmatig voorkomen onder geneeskundestudenten. Burn-outgerelateerde symptomen kwamen voor onder 46%, depressiegerelateerde symptomen onder 27% en angstgerelateerde symptomen onder 29% van de geneeskundestudenten. Burn-outgerelateerde symptomen onder geneeskundestudenten waren gecorreleerd met een slaapduur van minder dan 6 uur per nacht, een laag gevoel van geluk en een hoge herstelbehoefte na een dag studeren. Depressie- en angstgerelateerde symptomen waren vooral gecorreleerd met een laag gevoel van optimisme, een laag geluksgevoel, alsmede een hoge herstelbehoefte na een dag studeren. Deze bevindingen suggereren dat geneeskundestudenten een verhoogde kans hebben om mentale problemen te ontwikkelen, hetgeen universiteiten kan inspireren tot preventieve interventies.

Artikel 4: Hebben (toekomstige) artsen, waaronder (toekomstige) huisartsen, zelf ervaring met mentale problemen? Studie gericht op co-assistenten.
Voor de beantwoording van deze deelvraag zijn vragenlijsten uitgezet onder 709 coassistenten van dezelfde universiteit als in artikel 3 om burn-outgerelateerde symptomen te meten.
Burn-outgerelateerde symptomen kwamen voor onder 30% van de co-assistenten. Burn-outgerelateerde symptomen onder co-assistenten waren gerelateerd aan een laag gevoel van toewijding ten opzichte van het werk, een hoge werksnelheid- en -hoeveelheid, een hoge herstelbehoefte na een dag werken en een laag gevoel van optimisme. Deze correlaten zouden kunnen worden gebruikt om mentale problemen onder co-assistenten te voorkomen, door middel van aanpassingen in het medisch curriculum.

De artikelen van dit proefschrift suggereren dat de besluitvorming van huisartsen ten aanzien van mentale problemen bij kinderen en jongeren multifactorieel is en uit zowel objectieve als subjectieve componenten bestaat. Ook lijkt de besluitvorming tussen huisartsen te verschillen, hetgeen kan verklaren waarom er een verscheidenheid aan besluitvormingsondersteuningsmethoden bestaat. Sommige besluitvormingsondersteuningsmethoden zijn in het kader van onderzoek geïmplementeerd in de huisartsenpraktijk, zoals de MyGRaCE, *CHICA*, *Mobiletype*, *Youth StepCare*, *Consultation-liason method* (tussen huisartsen en psychiaters), *telepsychiatry consultation practice* en het *MC3 Program*. Een klinische implicatie is dat huisartsen een besluitvormingsondersteuningsmethode kunnen kiezen die overeenkomt met hun persoonlijke stijl van besluitvorming. Noodzakelijk is wel dat validiteit, betrouwbaarheid en bruikbaarheid van de beschikbare methodes verder onderzocht worden.
Een klinische implicatie met betrekking tot de mentale gezondheid van studenten is dat universiteiten laagdrempelige proactieve mentale ondersteuning moeten bieden aan geneeskundestudenten en co-assistenten, omdat veel van hen niet uit zichzelf hulp zoeken, alsmede het stimuleren van een stigma-reducerende onderwijsomgeving, bijvoorbeeld in samenwerking met de afdeling (Kinder- en Jeugd)Psychiatrie. Zodoende worden geneeskundestudenten toegerust met effectieve strategieën om met mentale problemen om te gaan. Ook worden ze zich bewust van hun kwetsbaarheid, zodat ze hun subjectiviteit kennen en hun ervaringen kunnen benutten in de praktijk.

De resultaten van dit proefschrift nodigen uit tot meer (longitudinaal) onderzoek naar de diagnostische precisie, voorspellende waarde en kostenefficiëntie van besluitvormingsondersteuningsmethoden. Ook is meer onderzoek nodig naar de prevalentie van mentale problemen onder afgestudeerde artsen, zoals huisartsen, alsmede de mogelijke effecten van deze problemen op hun manier van werken, hun besluitvorming en hun contact met patiënten. Sterke punten van dit proefschrift zijn dat het proefschrift een relatief onbekend onderzoeksterrein verkent, te weten de besluitvorming van huisartsen ten aanzien van mentale problemen bij kinderen en jongeren. Hiervoor zijn verschillende onderzoeksmethodologieën gebruikt en is gekozen voor een praktische insteek. Ook zijn enkele beperkingen te noemen, zoals de inclusie van een kleine huisartsenpopulatie, alsmede self-selectiebias in de onderzoeken onder geneeskundestudenten, co-assistenten en huisartsen. Tot slot wordt de interpretatie van de resultaten van dit proefschrift enigszins belemmerd doordat het onderzoek binnen één universiteit heeft plaatsgevonden, doordat oorzaak en gevolg van resultaten niet altijd uit elkaar konden worden gehaald en vanwege lage statistische *power*.

Omdat het zelf hebben van mentale gezondheidsproblemen mogelijk van invloed is op de besluitvorming van huisartsen, zou hierbij gekeken kunnen worden naar hoe (toekomstige) (huis)artsen werken, studeren en ontspannen. Zodoende kan men in de toekomst ernaar streven om gebalanceerde dokters op te leiden: personen die, in samenwerking met hun collega's, zich door middel van reflectie bewust zijn van hun grenzen en wensen binnen professionele kaders.

About the author

Lennard Theodore van Venrooij was born on Valentine's Day 1992 in Woubrugge, the Netherlands. There, he went to primary school the Kinderkring. After primary school, he went to high school Het Groene Hart in Alphen a/d Rijn. He spent his first year on location Noord (havo-vwo), thereafter he went to location Centrum (vwo, grammar school). Lennard chose Nature & Healthcare and Nature & Technology as his study profiles. Parallel to his education, he studied at Leiden University (Pre-University College). After his graduation, he studied Medicine at Leiden University Medical Center (LUMC) and followed two extracurricular courses: Honours College (Epidemiology/Clinical research) and the Leiden Leadership Programme. After he finished medical school, Lennard started a study on child and youth psychiatry in general practice, after which he began his PhD-research at Curium-LUMC and the department for Public Health and Primary Care at LUMC. Throughout his studies- and research periods, he wrote the articles for this thesis. Also, he wrote articles on hospital clowning. Lennard had several side jobs, such as a newspaper route, writing study material for fellow students and working in a restaurant. Furthermore, he was a mentor for first year medical students. Futhermore, he wrote and performed music, made multiple drawings, carried out (digital) craft projects and wrote columns, stories & poems.

Lennard loves integrating science and medicine with creativity. As far as the situation permits, he prefers though-out (life) choices. He views life as a training ground. Lennard hopes he has an encouraging and learning attitude towards others and enjoys humor (however, he isn't funny himself ☺). If it was up to him, he would try to discover the meaning of (un)responsible behavior together with others and how to optimally live together while living one's own life. Momentarily, he feels like a (child and youth) psychiatrist in general practice, but a general practitioner in (Child and Youth) Psychiatry. Because of this paradox, he more and more gets an impression of his ultimate discipline – which is presumably yet to be developed.

Over de auteur

Lennard Theodore van Venrooij werd geboren op Valentijnsdag 1992 in Woubrugge, Nederland. Hij ging daar naar basisschool de Kinderkring. Na de basisschool ging hij naar middelbare school Het Groene Hart in Alphen a/d Rijn. Het eerste jaar spendeerde hij op locatie Noord (havo-vwo), waarna hij naar locatie Centrum ging (vwo). Lennard koos voor de profielen Natuur en Gezondheid & Natuur en Techniek in het kader van Gymnasium. Hij volgde daarnaast Pre-University College aan de Universiteit Leiden. Na zijn eindexamen studeerde hij Geneeskunde aan het Leids Universitair Medisch Centrum (LUMC) en volgde daarnaast een tweetal extra-curriculaire trajecten: Honours College (Epidemiologie/klinisch onderzoek) en het Leiden Leadership Programme. Na zijn afstuderen startte Lennard een onderzoek naar kinder- en jeugdpsychiatrie in de huisartspraktijk, hetgeen uitmondde in een promotietraject bij Curium-LUMC i.s.m. de afdeling Public Health Eerstelijns Geneeskunde van het LUMC. Gedurende zijn studie- en onderzoeksperiode schreef hij de artikelen voor dit proefschrift, alsmede artikelen over ziekenhuisclowns. Ook had hij enkele bijbaantjes, zoals een krantenwijk, het schrijven van studiemateriaal voor medestudenten, horeca en was hij een mentor voor eerstejaars geneeskundestudenten. Voorts schreef en maakte Lennard muziek, knutselde en tekende hij, en schreef hij columns, verhalen & gedichten.

Lennard houdt van het integreren van wetenschap en geneeskunst met creativiteit. Voor zover de situatie dat toelaat, heeft hij een voorkeur voor weloverwogen (levens)keuzes. Hij ziet het leven als een leerschool. Lennard hoopt een bemoedigende en lerende houding ten opzichte van anderen te hebben en geniet van humor (maar heeft dit zelf niet ☺). Het liefste zou hij met anderen willen ontdekken wat (on)verantwoordelijke gedrag betekent en hoe mensen optimaal samen kunnen leven terwijl ze hun eigen leven leiden. Momenteel voelt hij zich binnen de huisartsgeneeskunde een (kinder- en jeugd)psychiater, maar binnen de (kinder- en jeugd)psychiatrie voelt hij zich een huisarts. Door deze paradox krijgt hij meer en meer een indruk van zijn uiteindelijke discipline - die mogelijk nog ontwikkeld moet worden.

List of publications

Scientific publications

Van Venrooij, L.T., Barnhoorn, P.C., 2017. Coulrophobia: how irrational is fear of clowns? Eur. J. Pediatr. 176, 677. DOI: 10.1007/s00431-017-2896-x

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Dankwoord

Zorgvuldig heb ik moeten nadenken over wie ik dankbaar ben voor de totstandkoming van dit proefschrift en waarvoor ik die persoon precies dankbaar ben. Toen dacht ik aan de woorden ''Less is more'' (en dat was ook conform het promotiereglement, waarin maximaal 800 woorden wordt genoemd).

Allereerst, Robert en Matty, jullie wil ik bedanken voor al jullie lessen over het doen van onderzoek en voor het delen van jullie expertise. Van jullie mocht ik met (soms letterlijk) vallen en opstaan leren, terwijl jullie mij hielpen om mijn gedachten en ambities te ordenen. Jullie geduld en begrip zullen me altijd bijblijven. Pap en mam, jullie ben ik enorm dankbaar voor alles wat jullie hebben gedaan om mij te laten groeien en mij op de been te houden. Te denken hierbij valt aan interpersoonlijke en huishoudelijke hulp. Pap, bedankt voor het zijn van een discussiepartner wanneer we praten over de zin des levens vanuit wetenschappelijke optiek en bedankt dat je voor mij het woord voerde toen dat nodig was. Mam, jou wil ik in het bijzonder bedanken voor het zijn van een derde onderzoeksbegeleider: je was er altijd wanneer notities moesten worden gemaakt van interviews, wanneer ik iemand nodig had om over mijn onderzoeksopzet na te denken en voor het nalezen van mijn stukken. Peter, Delise (paranimf), en kleine Suzanna, dank jullie wel voor de warme familieband die we hebben; ik ben blij met jullie. Stichting Sanctuary Kliniek, jullie wil ik bedanken om mij te laten proeven aan het praktisch dokter-zijn in een kleinschalige interculturele GGZ. Pieter, jou ben ik erg dankbaar voor het delen van jouw visie over hoe je in theoretische zin dokter kunt zijn. Jij hebt mij geholpen het avontuur in Onderzoeksland te vinden en ik heb genoten van de avonturen die we samen hebben beleefd. Erik, jij ook hartelijk bedankt voor de statistische ondersteuning en jouw hulp met het opzetten van de Klankbordgroep Burn-out.
Feike (paranimf), Tom en Paul, jullie waren sinds onze kindertijd een onmisbare vriend voor mij. Bedankt hiervoor. Ik hoop dat jullie ook aan mij iets hebben gehad. In het bijzonder ben ik God dankbaar voor mijn leven, het in stand houden van een *life line* en voor het mij leren geduld te hebben wanneer ik (te) snel wilde en wanneer ik te kritisch was op mezelf. Hij heeft mij er voortdurend aan herinnerd dat ik geen uitspraak hoef te doen over wat goed en wat kwaad is, dit heeft mij zielsrust gegeven. Uit genade en vertrouwen heeft Hij mij, door sommige nachtmerries heen, dromen gegeven van hoe het anders zou kunnen.

Als laatste wil ik mensen in meer algemene zin bedanken: zowel de mensen die mij mijzelf meer en minder waard lieten voelen. Van beide groepen heb ik geleerd. Ik wil de mensen bedanken die mij hebben geholpen in moeilijkere periodes, hetgeen achteraf unieke gelegenheden waren om mijzelf en mijn wereldbeeld opnieuw van de grond af op te bouwen. Ik wil de mensen bedanken die mij er in makkelijkere periodes op wezen dat ik qua kennis en kunde een *work in progress* ben, ik merk dat ik hen nodig heb om meer en meer mijn realiteitsbeeld te vormen en om dichter en dichter bij mijn doel te komen. Waar het mag, ben ik ook nog een beetje mijzelf dankbaar voor dat ik ondanks alles heb doorgezet. Tot slot, wil ik mijn dank uitspreken voor bepaalde 'toevalligheden' in mijn leven, zoals de boot *Balance* van mijn ouders: je was een fantastische studie- en werkplek, alsmede de figuurlijke inspiratie om zoveel mogelijk koers te houden op mijn (levens)reis.

‘Truth does not need to be defended, but it can be explored.’

Stellingen behorende bij het proefschrift getiteld 'Portal to Care: General practitioners' decision-making on child and youth mental health problems and the influence of their (lived) experience'

Stelling 1

Huisartsen verschillen in hun besluitvorming ten aanzien van hoe om te gaan met mentale problemen van kinderen en jongeren, derhalve moeten zij bewust worden gemaakt van verschillende overwegingen die betrekking hebben tot henzelf, tot het kind/de jongere en diens sociale context, alsmede tot hun samenwerking met andere jeugdhulpverleners (dit proefschrift).

Stelling 2

Computergestuurde besluitvormingsmethoden kunnen worden gebruikt om snel inzicht te krijgen in de ernst en complexiteit van de problematiek, wanneer een kind of jongere zich aanmeldt bij een huisartsenpraktijk (dit proefschrift).

Stelling 3

Gezondheidszorgsystemen verschillen tussen landen, de ontwikkeling van nieuwe besluitvormingsmethoden moet altijd af worden gestemd op de regio waarbinnen de methode wordt geïmplementeerd (dit proefschrift).

Stelling 4

Mentale problemen onder geneeskundestudenten en co-assistenten hebben vermoedelijk te maken met persoonlijkheidstrekken, zoals optimisme en geluk, alsook met het hebben van een gezonde werk-privébalans, zoals voldoende rust nemen na een dag studeren of werken (dit proefschrift).

Stelling 5

(Huis)artsen met eigen ervaring ten aanzien van mentale gezondheidsproblemen zijn beter in het herkennen en het begeleiden van kinderen en jongeren met mentale problemen dan collega's zonder deze ervaring (Straussner, 2018).

Stelling 6

In de huidige tijd van digitalisering, kunnen digitale ondersteuningsmethoden voor huisartsen bij hun besluitvorming rondom mentale gezondheidsproblemen bij kinderen en jongeren de fysieke afstand tussen professionals doen overbruggen, omdat eerstelijns en tweedelijns professionals elkaar gemakkelijker om hulp kunnen vragen (Verhaak, 2015).

Stelling 7

Met elkaar praten over mentale problemen door co-assistenten tijdens intervisiegroepen biedt een mogelijkheid om verslechtering van burn-outgerelateerde symptomen bij individuele co-assistenten tegen te gaan (Ishak et al., 2013).

Stelling 8

Bij de selectie van nieuwe geneeskundestudenten moet kritisch worden gekeken of een student de studie mentaal aan kan, de (ingeschatte) mate van toewijding kan hierbij leidend zijn (Prins et al., 2010).

Stelling 9

De hoge prevalenties van mentale problemen onder kinderen, jongeren (en volwassenen) zijn het gevolg van een maatschappij die uit balans is (TNO, 2022).

Stelling 10

Mentale problemen onder kinderen, jongeren (en volwassenen) vereisen een cultuurspecifieke benadering, omdat mentale problemen in verschillende culturen anders wordt beleefd (Sanctuary Kliniek, 2024).

Stelling 11

De hoge prevalenties van mentale problemen onder kinderen en jongeren betreft een generationeel probleem. De volgende generatie(s) zal/zullen hier waarschijnlijk minder last van hebben, omdat deze generatie zich meer bewust zal zijn van het bestaan van mentale problemen en van hoe deze zoveel mogelijk zijn te voorkomen (Youngworks, 2021).

Stelling 12

De hoge prevalenties van mentale problemen onder kinderen, jongeren (en volwassenen) van het afgelopen decennium zijn het gevolg dat men streeft naar de ‘homo universalis’ (de ideale mens). Derhalve zou men er wijs aan doen om te streven naar een ‘domo universalis’ (een huis voor allen) (HLN, 2023).

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