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SUPPORTING PUPILS' MENTAL HEALTH IN SCHOOLS

Teaching staff's and school nurses' perceptions and the suitability of a web-based support system for pupils

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To my children

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Teaching staff's and school nurses' perceptions and the suitability of a web-based support system for pupils
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ABSTRACT

School is an essential part of pupils' lives, and teaching staff and school nurses have an important role in supporting pupils' mental health. The aim of this study was to enhance knowledge related to supporting pupils' mental health in schools. The study has three phases, and a multi-methods approach was used.

In Phase I, teaching staff's perceptions of pupils' mental health and capacities to support it were studied. First, focus group interviews with teaching staff (N=16) were conducted. The data were analysed with inductive content analysis. Second, during an eLearning course, participants (N=8) submitted reflective writings about the challenging situations they had experienced with pupils. These writings were analysed with a combination of deductive and inductive content analysis. In Phase II, school nurses' (N=167) perceptions of pupils' mental health and their capacities to support it were studied. A national survey with structured questionnaires and open-ended questions for school nurses was conducted. The quantitative data were analysed using descriptive statistics and the qualitative data with manifest content analysis. In Phase III, the web-based support system (Depis.Net), originally developed for adolescents with symptoms of depression, was evaluated as a universal school-based mental health intervention among 21 adolescents. The quantitative data were analysed with descriptive statistics, and the qualitative data were analysed with deductive content analysis.

The results of this study show that, in terms of pupils' mental health, teaching staff are mainly concerned with challenging situations with pupils and how pupils with mental health problems should be supported. School nurses have capacities to support the mental health of pupils, but they desire more training on interventions. The web-based support system was found to be suitable as a universal mental health intervention in a school environment. Pupils used the web-based support system actively and gave positive feedback on it. Moreover, it was helpful in identifying pupils with needs for mental health support.

The capacity of teachers and school nurses to support pupils' mental health should be enhanced through offered training and the implementation of mental health interventions in schools. These measures would support pupils' mental health and the early recognition of mental health problems in schools. Web-based support systems may be useful interventions for mental health support in schools.

KEYWORDS: School, pupil, mental health, web-based support, school nurse, teaching staff, capacities, needs for knowledge, skills and support

TURUN YLIOPISTO
Lääketieteellinen tiedekunta
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PIHLA MARKKANEN: Oppilaiden mielenterveyden tukeminen kouluissa -
Opetushenkilöstön ja kouluterveydenhoitajien näkemyksiä sekä
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TIIVISTELMÄ

Koulu on merkittävä osa lasten ja nuorten elämää ja opetushenkilöstöllä ja kouluterveydenhoitajilla on tärkeä rooli oppilaiden mielenterveyden tukemisessa. Tutkimuksen tavoitteena oli saada tietoa oppilaiden mielenterveyden tukemisesta kouluissa. Tutkimus oli monimenetelmätutkimus, joka toteutettiin kolmessa vaiheessa.

Vaiheessa I tutkittiin opetushenkilöstön näkemyksiä ja valmiuksia oppilaiden mielenterveyden tukemiseen. Aluksi tutkimusaineisto kerättiin opetushenkilöstön (N=16) ryhmähaastatteluiden avulla ja analysoitiin induktiivisen sisällönanalyysin avulla. Myöhemmin opetushenkilöstö (N=8) kirjoitti osana verkkokurssia, reflektiivisiä kirjoitelmia kokemistaan haastavista tilanteista oppilaiden kanssa. Kirjoitelmat analysoitiin deduktiivis-induktiivisella sisällön analyysillä. Vaiheessa II kouluterveydenhoitajien (N=167) näkemyksiä ja valmiuksia oppilaiden mielenterveyden tukemiseen tutkittiin kansallisessa kyselytutkimuksessa, joka sisälsi strukturoituja ja avoimia kysymyksiä. Määrällinen aineisto analysoitiin kuvailevin tilastollisin menetelmin ja laadullinen aineisto analysoitiin sisällön analyysin avulla. Vaiheessa III alun perin masennusoireista kärsiville nuorille kehitettyä tukiohjelmaa (Depis.Net) testattiin kouluympäristössä 21 nuoren kanssa. Määrällinen aineisto analysoitiin kuvailevin tilastollisin menetelmin ja laadullinen deduktiivisen sisällön analyysin avulla.

Tutkimuksen tulokset osoittavat, että opetushenkilöstön pääasialliset huolet oppilaiden mielenterveydestä liittyivät haastaviin tilanteisiin oppilaiden kanssa sekä siihen, miten mielenterveysongelmista kärsiviä oppilaita tulisi tukea. Koulun-terveydenhoitajilla on valmiuksia oppilaiden mielenterveyden tukemiseen, mutta he toivoivat lisäkoulutusta interventioista. Verkkopohjainen tukiohjelma oli soveltuva käytettäväksi mielenterveysinterventiona kouluympäristössä. Oppilaat käyttivät tukiohjelmaa aktiivisesti ja antoivat siitä positiivista palautetta. Lisäksi se auttoi tunnistamaan oppilaita, joilla oli tarvetta mielenterveyden tuelle.

Opetushenkilöstön ja kouluterveydenhoitajien valmiuksia oppilaiden mielenterveyden tukemiseen tulisi vahvistaa tarjoamalla heille koulutusta ja mielenterveysinterventioita käyttöön. Tämä tukisi oppilaiden mielenterveyttä sekä mielenterveys ongelmien varhaista tunnistamista kouluissa. Verkkopohjaiset tukiohjelmat voivat olla hyödyllisiä oppilaiden mielenterveyden tukemisessa.

AVAINSANAT: Koulu, oppilas, mielenterveys, verkkopohjainen tuki, koulu-terveydenhoitaja, opetushenkilöstö, valmiudet, tiedon, taitojen ja tuen tarpeet

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Abbreviations

ADHD	Attention-deficit hyperactivity disorder
HBSC	Health Behaviour in School-aged Children survey
NICE	National Institute for Health and Care Excellence (United Kingdom)
PISA	Programme for International Student Assessment
OECD	Organisation for Economic Co-operation and Development
SD	Standard deviation
SHP	The School Health Promotion study
THL	Finnish Institute for Health and Welfare
UNICEF	United Nations Children's Fund
WHO	World Health Organization

List of Original Publications

This dissertation is based on the following original publications, which are referred to in the text by their Roman numerals:

I   Markkanen P, Anttila M, Välimäki M. Knowledge, skills, and support needed by teaching personnel for managing challenging situations with pupils. *International Journal of Environmental Research and Public Health*, 2019; 16 (19): 3646.

II   Markkanen P, Välimäki M, Anttila M, Kuuskorpi M. Reflective cycle: understanding challenging situations in a school setting. *Educational Research*, 2020; 62 (1): 46–62.

III   Markkanen P, Anttila M, Välimäki M. Supporting student's mental health: a cross-sectional survey for school nurses. *Children,* 2021; 8 (2): 129.

IV   Välimäki M, Markkanen P, Kuuskorpi M, Ylitalo M, Anttila M. A web-based program to support mental health at school: a feasibility study. Submitted.

1   Introduction

Mental health is an essential part of our overall well-being and health (The World Health Organization, WHO 2005). A good foundation for mental health develops during childhood and adolescence, and promoting mental well-being of young people is key in terms of public health (Stengård & Appelqvist-Schmidlechner 2010). Pupils' good mental health supports their ability to learn and study and prevents emotional and behavioural problems, violence, crime and substance abuse (National Institute for Health and Care Excellence [NICE] 2008, 2009).

Recent guidelines suggest that schools are an important community setting for mental health promotion and prevention since most children and adolescents attend schools (Rampazzo et al. 2016, WHO 2020). Some preventive mental health interventions in schools are universal, with a whole-school approach to promoting mental health for all pupils, targeting pupils at risk, or indicating pupils with symptoms of mental disorder (Fazel et al. 2014). Early recognition, promotion and prevention approaches may be effective in reducing mental health problems and improving pupils' mental health (Arango et al. 2018). Moreover, they may help prevent mental health problems in adulthood (Kessler 2007). Mental health interventions for pupils should be evidence-based and the integration of these interventions into curricula is recommended (Kutcher & Wei 2020).

School-based mental health interventions are often implemented by teachers. Teachers work closely with pupils, and they play a key role in supporting pupils' mental health. Teachers can be seen as role models, and they can teach mental health skills to pupils. (Aalto-Setälä et al. 2020, Coppens et al. 2015.) However, teachers may feel unsure about their knowledge and competence in supporting pupils' mental health (Askell-Williams & Lawson 2013, Sisask et al. 2014). Pupils' mental health problems manifest at school in various ways, such as behavioural problems, difficulties in concentration, conflicts with peers and school absenteeism. Therefore, teachers' have to manage a wide range of challenging situations involving their pupils. (Alter 2013, Crawshaw 2015, Sullivan et al. 2014.) Teaching staff should have access to training in recognising and understanding pupils' mental health problems and in mental health promotion and prevention (Kutcher & Wei 2020).

School and student health care have an important role in early detection of pupils' mental health problems by offering support to pupils with mental health problems and making referrals to specialised mental health care when needed (The Ministry of Social Affairs 2020b, 2020c). The work of school nurses enables them to have an active role in supporting pupils' mental health. School nurses work with pupils with mental health needs constantly and gain a great deal of experience in this area. (Jönsson et al. 2019, Moen & Skundberg-Kletthagen 2018.) However, school nurses' training related to pupils' mental health may be insufficient (Anttila et al. 2020b, Doi et al. 2018, Jönsson et al. 2019), and mental health interventions may not be implemented because of a lack of training and too much workpressure (Haddad et al. 2018, Pryjmachuk et al. 2012, Skundberg-Kletthagen & Moen 2017).

Pupils' mental health needs and potential outcomes of interventions vary depending on the pupils' individual circumstances. It is important to take into account local contexts and potential barriers to care, and prioritise reaching all possible participants, including pupils from minority groups and those with special needs. (WHO 2020.) A wide range of web-based interventions for supporting mental health has been developed. However, the research on school-based universal web-based interventions for promoting pupils' mental health is limited (Sakellari et al. 2021).

This thesis was conducted in the discipline of nursing science. The main concepts in nursing metaparadigm (person, health, environment and nursing) (Fawcett 1984) are considered in this study. *Person* may refer to patients, group, families, etc., and in this study, person means pupils. *Health* in this study is mental health of pupils. *Environment* in this study refers to the school environment and the school healthcare environment. The different aspects of environments are included, interactions within the school environment, between pupils and teaching staff, and between pupils and school nurses. *Nursing* in this study is considered to be actions that support pupils' mental health in schools, and mental health interventions that support pupils. An ecological theory, developed by Bronfenbrenner has been used to guide this study (Bronfenbrenner 1977). According to the model, pupils' individual personalities and their interactions with their environment influences their development and mental health. Therefore, it is essential that the diverse mental health needs of pupils are met and supported by teachers and school nurses.

The aim of the study was to describe pupils' mental health needs at school from different perspectives and to evaluate whether solutions to respond to those needs could be established. Teachers' and school nurses' perceptions of pupils' mental health as well as their capacities in supporting pupils' mental health were studied. Research themes related to teaching staff and school nurses were chosen as these professionals work closely with pupils. They support pupils' mental health in everyday situations in schools as well as when implementing mental health

interventions. Teaching staff is not a traditional research area in nursing science. However, the present study aimed to gain a wider understanding about mental health support in schools. The implementation of web-based interventions is one way to strengthen the mental health support in schools. In this study, the web-based support system Depis.Net, originally developed for pupils with symptoms of depression, was evaluated as a school-based universal mental health intervention for 8th grade pupils. Pupils' usage of the web-based support system was assessed.

In this study, school aged children and adolescents are referred as pupils. In Papers I and II, children and adolescents attending primary and secondary schools were referred as pupils. In this study pupil refers to children or adolescents attending primary, secondary or upper-secondary schools. The concept of mental health is used as a holistic concept including mental well-being. Supporting pupils' mental health in schools, as understood in this study, comprises: 1) promotion of positive aspects of mental health; mental well-being, 2) prevention of mental disorders and 3) supporting schooling and mental well-being of pupils with mental health problems. This study is linked to the Depis.Net and EduMental projects funded by University of Turku.

2 Review of the Literature

This chapter presents the existing related literature. Section 2.1 describes mental health among pupils, how mental health is promoted in schools, pupils' mental disorders and mental health services for pupils. Section 2.2 covers the support for pupils' mental health in school environments. Previous studies about teachers' and school nurses' perceptions of pupils' mental health and their and capacities to support pupils' mental health are also described. A wide range of web-based interventions for supporting pupils' mental health has been developed, and these interventions implemented in school settings were investigated for this study.

   A literature search to explore previous knowledge was conducted with the databases CINAHL, Pubmed (medline), ERIC and Web of Science. The search focused on empirical studies and literature reviews published in English within the last 10 years. In addition, the search was supplemented with a manual search by using reference lists of included publications. The search was completed with an exploration of internet sites of varied organisations, guidelines and from internet in general. The search strategies for teaching staff's and school nurses' perceptions of pupils' mental health are described in Appedix 1. The search strategies for web-based universal interventions for promoting pupils' mental health in schools are described in Appendix 2.

2.1 Pupils' mental health needs and available services

2.1.1 Mental health and well-being among pupils

Mental health can be defined in a number of different ways. WHO defines mental health as "a state of well-being where individuals recognise their abilities, they are able to cope with the normal stresses of life, work productively and fruitfully and make contribution to their communities" (WHO 2018). Mental health includes emotional, spiritual and social well-being (WHO 2014). The concept of positive mental health or mental well-being is central in mental health promotion and in public health work. *Mental well-being* draws the focus away from illnesses and

problems and emphasises the positive aspects of mental health; it is a resource and an essential part of health and well-being. (WHO 2005.) Mental well-being is considered to be a part of the mental health continuum; it is not a state that is either present or not. Mental well-being can be supported and developed despite the existence of a mental health disorder. (The Finnish Institute for Health and Welfare [THL] 2021a, WHO 2005.) Mental well-being has been found to be associated with better physical health, a better quality of life, success at school and positive health behaviour (Rampazzo et al. 2016).

Mental health and well-being among pupils have been evaluated in international and national surveys using instruments measuring life-satisfaction and happiness. According to these surveys, most pupils are satisfied with their lives. The Health Behaviour in School-aged Children (HBSC) survey is conducted in 45 countries across Europe and North America. Results from the survey conducted in 2018 shows that pupils' life satisfaction is good with average of score of 7.8 out of 10. Life satisfaction among pupils decreased with age. At age 11 it was 8.3, and at age 15 it was 7.4. Life satisfaction among boys was higher than among girls in most countries, and the decrease by age was greater among girls. (Inchley et al. 2020.)

In the Programme for International Student Assessment (PISA), 15-year-old pupils were asked questions about life satisfaction, happiness, sadness and the sense of purpose in life. Across the Organisation for Economic Co-operation and Development (OECD) countries, on average 67% of pupils reported being satisfied with their lives. Most of the pupils, over 80%, reported feeling sometimes or always satisfied with their lives, and about 6% reported always feeling sad. Finnish pupils reported quite high life satisfaction; 84% of them reported high life satisfaction which was the fourth highest percentage among the countries. (OECD 2019.)

The United Nations Children's Fund (UNICEF) made an international ranking of child well-being based on indicators of mental and physical health and social/academic skills. Overall, The Netherlands ranked highest out of 38 countries, and Finland was fifth. For ranking pupils' mental well-being, the life-satisfaction results from the PISA 2018 study and the suicide rates among 15- to 19-year-olds from the WHO mortality database 2015 were combined. Again, the Netherlands ranked highest, and Finland was twelfth among 38 countries. (UNICEF 2020.)

In Finland, the School Health Promotion (SHP) study examines the well-being, health and schoolwork of Finnish pupils. The SHP study is conducted every second year for pupils in the fourth and fifth grades in primary schools, the eighth and ninth grades in secondary schools, and the first and second years of upper secondary schools (both vocational and general education). According to the SHP study conducted in 2019, most pupils considered themselves to be mainly satisfied with their lives, 90% of fourth and fifth graders and 75–76% of pupils in other grades. (THL 2019.)

2.1.2   Promoting mental health in schools

School is an essential part of all pupils' lives, and the school setting has a significant impact on their mental health. School can promote pupils' mental health by providing a safe and structured environment, by enabling opportunities for involvement in school life, by offering positive experiences in learning and by promoting a positive atmosphere. (THL 2021b, WHO 2005.) In the school environment, supportive relationships with peers can be developed, and factors related to school climate, feeling safe at school and feeling connected to one's school, as well as having supportive relationships with peers, have been found to promote mental health (Lester & Cross 2015). The risk factors for mental health in the school environment include failures in academic achievements and environments that do not support learning or attendance (WHO 2005). Stress related to school has been found be strongly associated with both depressive symptoms and reduced life satisfaction (Moksnes et al. 2016).

Prevention in mental health aims to reduce the prevalence of mental health problems. (Arango et al. 2018). Mental health prevention programs may be: 1) universal/primary, 2) targeted/selective, or 3) indicated. Universal/primary interventions are intended for all pupils to support their mental health and to prevent disorders and symptoms. Universal interventions should be effective, safe and part of standard practice to avoid stigma, for example, school-based bullying prevention programs. Targeted/selective interventions focus on individuals at risk of developing a disorder. Indicated interventions are for individuals with mild symptoms of disorder. (Arango et al. 2018, Fazel et al. 2014, Goodman & Scott 2012.) Intervening should be easier and more effective at an earlier stage rather than later, if a disorder onsets (Goodman & Scott 2012).

Universal interventions for promoting positive mental health and preventing mental health problems, behavioural problems, and substance use, are recommended for all adolescents (WHO 2020). Both universal interventions and targeted interventions for pupils with mental health needs are recommended in schools. Moreover, training, support and mentoring for teachers and other professionals in schools is recommended to promote pupils' mental health. (NICE 2008, NICE 2009, Rampazzo et al. 2016.) School-based interventions have shown promising results for promoting pupils' mental health, but more research on inteventions is still needed (Durlak 2011, O'Reilly et al. 2018). According to a recent review, mental health promotion interventions focusing on resilience and coping have had a positive impact on pupils' mental health. Positive results were found when interventions were delivered by teachers. Universal interventions focusing on resilience included social and emotional learning, well-being programs, mindfulness programs or stress management programs. (Fenwick-Smith et al. 2018.)

2.1.3   Mental disorders among pupils

Most mental health disorders begin at a young age (De Girolamo 2012, Kessler 2007). The estimated prevalence of pupils' mental health disorders varies between 10% and 20% (Kieling et al. 2011, Polanczyk et al. 2015). It is difficult to estimate the number of pupils with diagnosable disorders because the diagnostic criteria of related studies vary, as does the heterogeneity of the studies (Kieling et al. 2011, Polanczyk et al. 2015). Moreover, there is a large number of pupils with symptoms of mental disorders, who are not getting professional mental health support (Merikangas et al. 2009). According to a wide meta-analysis of 41 studies in 27 countries, the prevalence of a mental disorder among pupils is 13.4% (Polanczyk et al. 2015).

The number of pupils with diagnoses of mental health disorders and neurodevelopmental disorders has increased during the past two decades in many high-income countries (Atladottir et al. 2015, Gyllenberg et al. 2018, Lempinen et al. 2019). In a time-trend study carried out in Finland, the use of mental health services by eight-year-olds in four cross-sectional studies over a 24-year period were studied. According to the results, the use of child psychiatric services increased from 2% in 1989 to 11% in 2013. The highest increase of mental health services use was among children whose parents and teachers had identified the mental health problems. This indicates that the increase of service use was greatest among children who had the greatest need for professional care. (Lempinen et al. 2019.) In a birth cohort study carried out in Finland, groups from 1987 and 1997 were compared. The participants were followed up on from age 12 to age 18 years. The use of specialised mental health services increased relatively and absolutely among pupils. The highest increases in diagnoses were for depression, anxiety disorders and attention deficit hyperactivity disorder [ADHD]. (Gyllenberg et al. 2018.)

The most common mental health disorders among pupils are anxiety disorders, depression, ADHD and behavioural disorders (Polanczyk et al. 2015). Among younger pupils in primary school, disruptive behaviour and anxiety disorders are more common, particularly separation anxiety and oppositional defiant disorder. Among older pupils, generalised anxiety, conduct disorder and depression are more common. Comorbidity in pupils' mental health disorders is common. (Goodman & Scott 2012.) The estimated prevalence of any anxiety disorder among pupils is 6.5% (Polanzyk et al. 2015). Anxiety disorders comprise fears and worries, which may affect pupils' social, emotional and academic functioning and cause significant distress. Generalized anxiety often accompanies some other anxiety disorder, and depression often accompanies an anxiety or behavioural disorder. (Goodman & Scott 2012.) Anxiety and depressive disorders and their combinations are a common diagnosis causing school absenteeism (Dulcan et al. 2018, Riordan & Singhal 2018).

The core symptoms of depression for pupils are similar to those for adults. Pupils' depression may manifest as sadness, loss of interest or pleasure, changes in appetite, difficulties in sleeping or problems with cognitive functioning, such as concentrating and learning. (Avenevoli et al. 2008.) Depression causes suffering and it is a risk for suicide. Symptoms of depression can range from mild to severe. The estimated prevalence of depression among pupils varies. The prevalence of major depression has been estimated to be 1%–3% among children before puberty and 3%–9% among adolescents. (Dulcan et al. 2018.) The prevalence of any depressive disorder among pupils has been estimated to be 2.6%, and of a major depressive disorder, 1.3% (Polanczyk et al. 2015).

ADHD is one of the most common neuropsychiatric disorders among pupils, with an estimated prevalence of 3%–8% (Polanczyk et al. 2015). Pupils with ADHD may have difficulties in getting along with peers. Their symptoms can cause difficulties in learning, and they may underachieve at school ADHD is often accompanied with oppositional defiant disorder or conduct disorder (Goodman & Scott 2012, Dulcan et al. 2018.)

Children with oppositional defiant disorder have long lasting symptoms of aggression and behavioural problems, which can include disobedient and defiant behaviour. They may appear negative, stubborn or provocative, but their behaviour does not violate the rights of others. Pupils with conduct disorder often violate the personal rights of other people, and break social rules, with their antisocial and aggressive behaviour. Conduct disorder usually includes loss of interest in school, school failure and drop out. (Dulcan et al. 2018.)

2.1.4 School and student health care and mental health services for pupils

There is variation in school health services in different countries. According to overview of 102 countries, most of the countries have dedicated school health personnel (N=59), and most often, in 54 countries it includes nurses. In the rest of the countries health care personnel may provide services in other settings, but make visits to schools or invite students to primary health care clinics. (Baltag et al. 2015.) In Europe, nurses are the most widely reported professionals working in school health care, followed by doctors and psychologists (Van Der Pol et al. 2020). In Finland, every municipality has school and student health care services for pupils. School health care is provided for pupils in grades 1–9, and student health care is provided for pupils in secondary schools, universities, and universities of applied sciences. (The Ministry of Social Affairs and Health 2020b, 2020c.) The aim of these services is to promote social, physical and mental well-being as well as learning (Student Welfare Act 1287/2013), and they are free of charge for pupils under the

age of 18. Preventive services are free of charge for students of all ages. (The Ministry of Social Affairs and Health 2020b, 2020c, Government Decree 338/2011.) In school and student health care, school nurse and physician work as a team. School health care is part of school welfare services, which also include the services of school social workers and psychologists. (The Ministry of Social Affairs 2020b, THL 2021c.)

School and student health care for pupils includes: health examinations, oral health care, early identification of pupils with special needs, special examinations required to assess an individual's health status, support for parents, and health and safety inspections of the school environment. Pupils health examinations by school nurses are scheduled annually in primary school, seventh grade and first year of upper-secondary school. Extensive health examinations with school nurse and physician are conducted in first, fifth and eighth grades of comprehensive school and during the first or second year of studies in upper secondary school. Needs for special support are evaluated, and plans for support arrangements are made and evaluated. School nurses promote and evaluate both the physical and mental well-being of pupils. (Government Decree 338/2011.) Pupils with mental health problems get support from their school and student health care, and if extended support is needed, they are referred to mental health services. School and student health care services have an important role in mental health prevention, early detection of mental health problems and supporting pupils with mental health problems in scools.

According to the SHP study of 2019, most pupils had visited the school welfare personnel, most often the school nurse (additional visits to health examinations during the last school year). Access to school health care services was considered to be easy. (Kivimäki et al. 2020a, Kivimäki et al. 2020b.) Nearly half of the pupils felt that there was an adult available at school who they could talk about their concerns. However, 28% of fourth and fifth graders, and 34% of eighth and ninth graders did not know if there was such an adult in the school. (Kivimäki et al. 2020a.)

Pupils needing more sp specific support for their mental health problems are referred to mental health services. Mental health services are provided by primary services, specialised health care, private service providers and third sector actors. (The Ministry of Social Affairs and Health 2020a.) Based on the Health Care Act and the Mental Health Act, municipalities are responsible for offering mental health services (Health Care Act 1326/2010, Mental Health Act 1116/1990). The ways in which mental health services are organised vary widely accross the country (Aalto-Setälä et al. 2020).

Easy-access mental health services are recommended so that pupils who are not getting professional support are able to get help without barriers. These services may contain: drop-in services, access without the permission of parents, cost-free services, short waiting times, easily accessable services with public transport,

availability of web-based programs or services, a welcoming environment, discrete entrance and the possibility to stay anynomous. (Coppens 2015, Leeman & Hämäläinen 2015, Vorma et al. 2020) In Finland, some municipalities have easy-access services for adolescents (Aalto-Setälä et al. 2020).

At the primary level, the organisation offering mental health services varies (Huikko et al. 2017). Most often, the mental health services for children younger than 13 years old are offered by social services; family guidance centres provide support for families and children with mental health problems (Aalto-Setälä et al. 2020). Family guidance is provided by an interprofessional collaboration of psychologists, social workers, physicians, and other professionals as needed (Social Welfare Act 1301/2014, THL 2020). Some municipalities in Finland have centres for youth that provide support for substance abuse and mild mental health problems. Sometimes services for pupils with mental health problems are offered by primary health care centres. (Aalto-Setälä et al. 2020.)

Specialised mental health care for pupils is recommended if support at the primary level is insufficient. For young people under 23 years old, after referral to specialised care, treatment evaluations and specialist assessments must be completed within six weeks. Treatment must be provided within three months of the notation of the need of treatment. (Ministry of Social Affairs and Health 2020a, Health Care Act 1326/2010.) In Finland, specialised mental health services for children and adolescents are usually organised by hospital districts (Mieli, Mental health Finland 2020). Some municipalities have their own special services for children and/or adolescents. Child psychiatry offers treatment in outpatient clinics and wards for children younger than 13 years old, and adolescent psychiatry offers treatment for adolescents aged 13–17 years old. Specialised child and adolescent psychiatric services give consultative support to primary services and treatment to children and adolescents in outpatient clinics and hospital wards. (Aalto-Setälä et al. 2020.)

2.2 Support for pupils' mental health in school environments

2.2.1 Teachers supporting pupils' mental health

Teachers work closely with pupils, so a positive teacher-pupil relationship can support a pupil's mental health in their every-day life (Krane et al. 2011, Graham et al. 2016). Teachers generally feel a responsibility to promote their pupils' mental health. However, they may feel unsure about their abilities to recognise and support pupils with mental health problems (Askell-Williams & Lawson 2013, Ekornes 2016, Graham et al. 2011, Sisask et al. 2014). In a mixed methods study of Norwegian teachers, focus group interviews (N=15) and a survey (N=771) were

conducted. Only a minority of teachers indicated having adequate knowledge related to pupils' mental health. (Ekornes 2016.) Teachers with a better understanding of pupils' mental health are more likely to support pupils with mental health needs. In addition, teachers' own well-being and satisfaction with the school climate have been found to be associated with confidence in offering support and getting involved with pupils' mental health problems. (Sisask et al. 2014.)

In an interprofessional collaboration between teachers and other professionals in supporting pupils' mental health, responsibilities should be clear. Teachers have expressed that they would benefit from guidance as well as a clear mutual understanding of roles and responsibilities of professionals. (Mælan et al. 2020.) Teachers have also expressed their wish for training on mental health disorders, management of challenging behaviour, positive behavioural support, and skill training (e.g., social skills and anger management) (Moon et al. 2017). The stress that teachers endure that is related to supporting pupils' mental health has been found to be caused mainly by a discrepancy between perceived expectations and perceived ability (Ekornes 2016).

When mental health interventions are delivered by teachers, their knowledge about mental health is essential. Teachers' vocational training, resources and supervision have been found to increase their capabilities to assess and support pupils' mental health (Romer et al. 2018). Teachers' mental health literacy of depression has been found to be positively associated with pupils' depression literacy (Miller et al. 2019). Teachers with suicide prevention training were found to be more confident in intervening in concerning behaviour among pupils. Moreover, adolescents were found to be more likely to talk to trained teachers about suicidal thoughts or about their worries about their peers. (Hatton et al. 2017.)

Mental health problems among pupils may manifest at school as difficulties in learning and concentrating, school absence, behavioural problems and difficulties with peers (Dulcan et al. 2018). Teachers often find pupils' behavioural problems and the management of them concerning (Alter et al. 2013). Teachers have reported that getting off-task and displaying low-level disruptive behaviour are the most frequent behavioural problems among pupils, and teachers have difficulties in managing such behaviour (Alter 2013, Crawshaw 2015, Sullivan et al. 2014).

Teachers' praise for pupils is important for building positive teacher-pupil relationships, and this may reduce behavioural problems (Owens 2018). According to a systematic review about mental health interventions in schools, interventions focusing on supportive interactions had positive effects on pupils' mental health. Interventions promoted pupils' mental well-being, and moreover, internalising and externalising symptoms decreased. However, more detailed knowledge is needed about what types of interactions support pupils' mental health most effectively. (Garcia-Carrion et al. 2019.)

2.2.2 School nurses supporting pupils' mental health

Supporting pupils' mental health is an essential part of school nurses' work. They identify pupils' mental health problems, make referrals to mental health services, provide brief interventions and support pupils in their everyday environments. (Anttila et al. 2020b, Bohnenkamp et. al. 2015, Ellertsson et al. 2017, Jönsson et al. 2019, Poutiainen et al. 2015, Pryjmachuk et al. 2012, Ravenna & Cleaver 2016, Skundberg-Kletthagen & Moen 2017.) However, school nurses may lack confidence in their ability to support pupils' mental health due to insufficient training (Haddad et al. 2018, Pryjmachuk et al. 2012, Skundberg-Kletthagen & Moen 2017). School nurses have indicated that they need more training in supporting pupils with mental health problems (Anttila et al. 2020b, Doi et al. 2018, Jönsson et al. 2019). School nurses have expressed their need for training and tools, especially for supporting pupils with minor or moderate mental health problems. Training on more severe mental health disorders was found to less important, as school nurses were able to refer pupils to mental health services in those cases. (Doi et al. 2018.) Moreover, school nurses have expressed their wish for training on assessment and brief interventions related to pupils' mental health (Moen & Skundberg-Kletthagen 2018). In a qualitative study performed in Finland, school nurses (N=21) wanted more knowledge on pupils' mental development and mental health problems, while they were still quite satisfied with their own education (Anttila et al. 2020b).

School nurses lack the tools and interventions needed to support pupils' mental health. For example, school nurses have indicated that symptoms of anxiety are common among pupils. Still, they reported not using any evidence-based tools for assessing anxiety or interventions for reducing it. (Muggeo & Ginsburg 2019.) In addition, school nurses have expressed their desire for clinical supervision and reasonible workloads so that they would have time to support pupils' mental health and implement interventions (Anttila et al. 2020b, Jönsson et al. 2018, Moen & Skundberg-Kletthagen 2018, Muggeo & Ginsburg 2019, Pryjmachuk et al. 2012). School nurses have especially identified the need for supervision from mental health professionals (Moen & Skundberg-Kletthagen 2018, Pryjmachuk et al. 2012).

School nurses collaborate with other professionals in schools when supporting pupils' mental health (Anttila et al. 2020b, Bohnenkamp et al. 2015, Granrud et al. 2019). Finnish school nurses have been found to value the possibility to share with colleagues and get support from them. They would want even more open interprofessional collaboration with a school welfare team that would include teaching staff as well as professionals in specialised care and youth psychiatric care (Anttila et al. 2020b). Public health nurses working in secondary schools in Norway (N=18) reported sometimes having difficulties in interprofessional collaboration because their role and their competence in supporting pupils' mental health is not always clear to other professionals in schools (Granrud et al. 2019).

2.2.3 Web-based universal interventions for promoting pupils' mental health in schools

Web-based universal interventions for pupils in schools have been developed and studied. Altogether, five universal web-based intervention studies were found (see Appendix 2): the computerised cognitive behaviour therapy (cCBT) program Think, Feel, Do (Attwood et al. 2012); E-health4Uth, which sent tailored web-based messages focused on adolescents health behaviours and well-being (Bannink et al. 2014); the e-couch Anxiety and Worry program (Calear et al. 2016); a digital game-based intervention The Adventures of DoReMiFa, which combined CBT and a positive psychology model (Shum et al. 2019); and The Climate School's combined program, the Climate School's substance use course and the Climate School's mental health course for adolecents (Teesson et al. 2020). The interventions were delivered via an online platform during health education classes and were combined with classroom activities.

Two of the web-based interventions (Think Feel Do, The Adventures of DoReMiFa) were implemented at the primary school level. The study by Attwood et. al (2012) on the Think Feel Do intervention had two phases: universal and targeted. It was provided as a universal intervention to 13 participants (all boys aged 10–12 years old), who were assigned to either a cCBT group or a matched computer gaming condition. The results showed that cCBT may have a positive impact in reducing symptoms of depression and anxiety. In a quasi-experimental design study, The Adventures of DoReMiFa intervention was found to enhance pupils' mental health literacy and promote perspective taking. There was no evidence on the effects on symptoms of anxiety. However, a preventive impact was found, which was encouraging (Shum et al. 2019).

Three of the web-based interventions were implemented among pupils at the secondary or upper secondary level (E-health4Uth, E-coach Anxiety and Worry program, the Climate School's substance use course and mental health course). E-health4Uth was tested at 12 secondary schools in an RCT study. Pupils in the E-health4Uth group received tailored web-based messages. Pupils in the E-health4Uth and consultation group were additionally referred to a school nurse consultation if the need for mental health support was identified. In The E-health4Uth and consultation intervention, results indicated that there was a positive impact on pupils' mental health (Bannink et al. 2014). In an RCT study by Calear et al. (2016) on the E-couch Anxiety and Worry program, a web-based intervention for generalised anxiety was tested as an universal preventive intervention for upper secondary school pupils. There was no significant positive effect on participants' mental health or on symptoms of anxiety and depression. Moreover, there was no effect on intervention outcomes in interventions delivered by a teacher or additional support from mental health services. The Climate School's substance use course and mental health course

were tested in a cluster-randomised controlled trial in secondary schools. The combined intervention with both online courses, was found to be effective in increasing the knowledge of alcohol, cannabis, and mental health, and in preventing the use of alcohol and reducing symptoms of anxiety and depression. (Teesson et al. 2020.)

Adherence was reported in two studies. The Adventures of DoReMiFa combined online digital game-based lessons and classroom lessons. This combination was used to prevent dropout from the program and to enhance learning. Of the 11 modules, 68.9% of pupils completed 50% or above and 31.1% completed 50% or below (Shum et al. 2019). Adherence to the Anxiety and Worry program was evaluated by the program completion records of each section of the intervention. In the teacher-supported intervention, 78% adhered for the first two weeks, 43% for four weeks and 36% for all six weeks. Participants in mental health services adhered to the program significantly more; 87% completed two weeks, 65% completed four weeks, and 50% completed all six weeks of the program (Calear et al. 2016).

2.3   Summary of the literature review

The existing literature related to pupils' mental health needs and central concepts was reviewed. Mental health is essential part of health and WHO (2018) has defined it as a "state of mental well-being where individuals recognize their abilities, they can cope with normal stresses of life, can work productively and fruitfully, and are able to make contribution to their community." Mental well-being is part of mental health continuum, and it refers to positive aspects of mental health. Mental well-being can be supported and developed despite the existence of mental health disorder.

Literature supports that pupils' mental health should be supported in schools and schools are best settings for implementing interventions to promote pupils' mental health. Most mental disorders begin at young age and also pupils with milder mental health problems should be supported in their everyday environment. According to international studies, teachers may feel unsure about their abilities in recognize and support pupils with mental health problems. The literature review did not identify the perceptions of Finnish school teachers on pupils' mental health.

Literature supports that school nurses need more training in supporting pupils with mental health problems and they have hoped for tools and interventions to support pupils' mental health. School nurses have hoped for reasonable workload so that they would have time to support pupils' mental health and implement interventions. Literature review did not identify earlier national surveys for Finnish school nurses about pupils' mental health.

A wide range of web-based interventions for supporting mental health has been developed. However, web-based universal interventions for pupils implemented in schools are less studied. Literature review identified five intervention studies of web-based universal mental health interventions in school settings.

3   Aims

The aim of the study was to describe pupils' mental health needs at school from different perspectives and to evaluate whether solutions to respond to those needs could be established. The study included three phases, as follows:

Phase I Teaching staff's perceptions and capacities

1. To describe teaching staff's perceptions of pupils' mental health (Papers I, II).
2. To describe teaching staff's capacities in supporting pupils' mental health (Papers I, II)
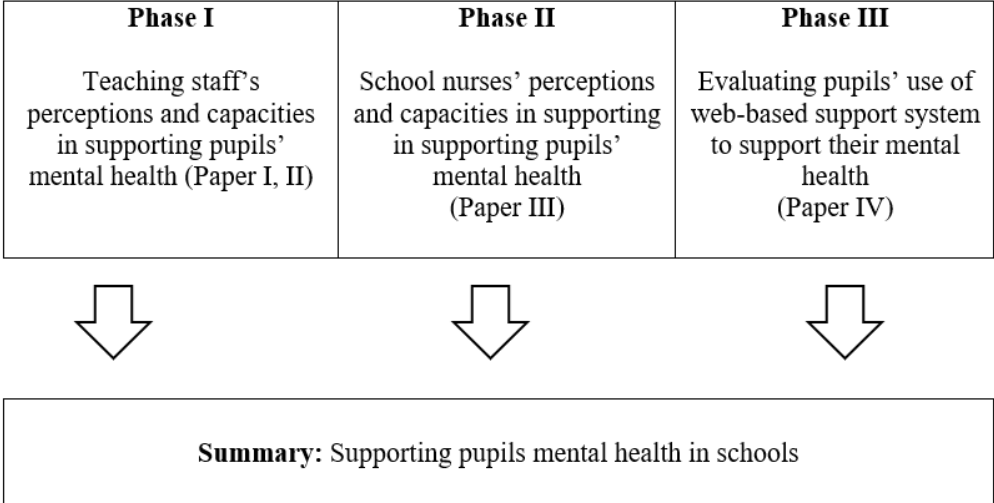
Phase II School nurses' perceptions and capacities

1. To describe school nurses' perceptions of pupils' mental health (Paper III).
2. To describe school nurses' capacities in supporting pupils' mental health (Paper III).

Phase III Suitability of a web-based support system for pupils

1. To evaluate pupils' usage of the web-based support system and its suitability for supporting pupils' mental health (Paper IV).

The first two phases described what kind of mental health needs pupils have in schools from the teaching staff's and school nurses' perspectives. The teaching staff's and school nurses' capacities and needs for support and training related to pupils' mental health were studied. In phase III, the suitability of the web-based support system for promoting pupils' mental health and its potential for strengthening support for pupils and early recognition of pupils with mental health problems were evaluated by studying pupils' usage of the support system. The study phases are described in Figure 1.

Phase I	Phase II	Phase III
Teaching staff's perceptions and capacities in supporting pupils' mental health (Paper I, II)	School nurses' perceptions and capacities in supporting in supporting pupils' mental health (Paper III)	Evaluating pupils' use of web-based support system to support their mental health (Paper IV)

Summary: Supporting pupils mental health in schools

Figure 1. Study phases.

4 Materials and Methods

4.1 Theoretical and methodological approach of the study

The theoretical approach of the study is based on an ecological theory of human development and socialisation developed by Bronfenbrenner (Bronfenbrenner 1977). According to ecological theory, pupils' interactions with their environment influence their development. The ecological theory emphasises the perspective that mental health is shaped by individual factors as well as the social, economical and physical environments of everyday life (WHO 2014). The ecological theory has been used in public mental health research and mental health promotion, and in interventions in schools (e.g., Conroy et. al 2019, Cross & Hong 2012, Eriksson et al. 2018, Macklem 2014, Sutherland et al. 2013).

In Bronfenbrenner's earlier work, he described that an ecological environment comprises four levels of environmental systems: 1) a microsystem (immediate settings in which the child or adolescent interacts), 2) a mesosystem (interrelations between two or more settings in which the pupil actively participates, such as school and home) 3) an exosystem (social structures that influence the individual indirectly) and 4) a macrosystem (laws, culture, norms, etc.) (Bronfenbrenner 1981). Later, a fifth level was added to the model: chronosystem, referring to changes over time in development (Rosa & Tudge 2013). In the final version of the bioecological theory, or bioecological model, the Process-Person-Context-Time model (PPCT) was added to guide longitudinal research (Rosa & Tudge 2013). The PPCT model is not utilised in the present study, however, since there is no longitudinal study design.

In this study, the ecological model has been used to guide in the understanding of pupils' development and which aspects in the school environment may influence their development and mental health. The classroom environment, school climate, teacher-pupil relationship, peer relationships as well as individual characteristics, such as temperament, special needs, etc. influence pupils' development and mental health (Macklem 2014). Pupils with diverse mental health needs attend schools every day, and it is crucial that the adults in their everyday environment offer the support they need. Therefore, studying the perceptions of teaching staff and school nurses

regarding the support and training they need is essential when the aim is to support pupils' mental health at school.

This study focused on pupils' microsystem in a school environment. In Phase I and II, the perceptions of teachers and school nurses on pupils' mental health needs, and teachers' and school nurses' capacities to support pupils' mental health, are described. In Phase III a web-based support system for adolescents was tested in a school environment. Pupils participated in the Depis.Net program individually, but they used the program in a school environment; there was a weekly schedule for the classes in which they participated in the program, and a teacher and a school administrator gave their support in the intervention use.

In this study, a multi-method approach was used. The methodological decisions were made based on the aims of each phase of the study, and different study designs with individual methods were used. Each phase was conducted and analysed consecutively, and finally, the results were combined. The multi-method approach provides a wider understanding than qualitative or quantitative approaches can give separately. (Driessnack et al. 2007, Fetters et al. 2013.) Moreover, the data sources—teaching staff, school nurses and pupils' feedback—and their usage of the support system provided information from different perspectives of pupils' mental health in a school setting (Fetters et al. 2013, Kroll & Neri 2009).

4.2   Study design and setting

In Phase I, a descriptive qualitative study design (Polit & Beck 2010, Sandelowski 2000) was used to study teaching staff's perceptions about challenging situations with pupils in a school environment. Their capacities in recognising pupils' mental health needs and in supporting pupils with mental health problems were studied. First, focus group interviews for teaching staff were conducted (Paper I). Second, teaching staff's reflections were explored in reflective writings during an eLearning course (Paper II). A qualitative approach (Polit & Beck 2010, Sandelowski 2000) was chosen to elicit the teaching staff's perceptions and the participants were given the opportunity to discuss and precisely describe the reality of their work with pupils.

In Phase II, a descriptive cross-sectional study design (Polit & Beck 2010) was used to describe school nurses' perceptions about the pupils' mental health. School nurses' capacities in recognising pupils' mental health needs and in supporting pupils with mental health problems were studied and a national survey for school nurses was conducted. The quantitative approach was used to gain a wider picture of pupils' mental health needs in schools, as school nurses meet all the pupils and run regular health examinations for them.

In Phase III, a descriptive mixed-methods study design environment (Fetters et al. 2013, Kroll & Neri 2009,) was used to evaluate the suitability of the web-based

support system (Depis.Net) for supporting pupils' mental health in a school environment (Paper IV). The mixed-methods approach was used to gain to a wider understanding of adolescents' usage and adherence of the web-based support system and the suitability of the program to school.

The study was conducted in two settings. First, one comprehensive school in Southwest Finland was used for the data collection (Papers I, II, IV). The school provides education for pupils in primary school (grades 1–6) and lower secondary school (grades 7–9). The whole school serves 550–600 pupils. Second, a national survey for school nurses working in schools or in student health care was conducted (Paper III).

4.3 Study population, sampling methods and sample

In Phase I, the study population consisted of teaching staff of primary and secondary school (class teachers, subject teachers, special education teachers and classroom assistants). In primary schools in Finland, most teachers are class teachers with a master's degree in education (Basic Education Act 628/1998). Subject teachers have a master's degree in the subject they teach and have completed a certain amount of pedagogical studies. In lower secondary schools, teachers are subject teachers but they may teach some subjects at the primary school level (for example, language teachers). Special education teachers have master's degree in special education; their training concentrates on reading, language, mathematical, and behavioural issues. They teach both at the primary and secondary levels of comprehensive school. Classroom assistants have vocational studies and support pupils with special needs during the school day. (The Ministry of Education and Culture 2020.)

At the time of this study, there were altogether 68 members of the teaching staff working at the school. Purposive sampling was used to reach participants with knowledge about the challenging situations with pupils (Polit & Beck 2010). First, teaching staff with experiences of challenging situations with pupils were recruited to participate in focus group interviews and 16 of them participated. (Paper I.) Second, an eLearning course for teaching staff aiming to promote their ability to manage challenging situations with pupils was piloted. The opportunity to participate in the course was offered to all the members of the teaching staff. There were 15 participants in the eLearning course: 10 of them completed the course and eight gave their informed consent to participate in the study. (Paper II.)

In Phase II, the study population consisted of public health nurses working in schools or student health care (Paper III). Total sampling was used to recruit school nurses from the member register of The Finnish Association of Public Health Nurses. All the members of the association who were working as school nurses were asked

to participate in the study. The invitation email was sent by association to school nurses (N=648), and 136 participated.

In Phase III, the study population consisted of 14–15-year-old adolescents in the eighth grade at school (Paper IV). Purposive sampling was used, and one school who was willing to participate in the study was chosen. The opportunity to participate in the study was offered to all four eighth grade classes at the school, and one class with 22 pupils was willing to participate. Total sampling in the class was used. Inclusion criteria for the pupils to join the study were ability and willingness to participate during school time, voluntary participation and written informed consent. Informed consent was also obtained from the guardians if the pupil was under 15 years old. All 22 pupils in the class were invited to participate in the study, and 21 were willing to participate.

The study design, sampling methods and participants in each phase and paper are described in Table 1.

Table 1. Teaching staff's and school nurses' perceptions and the suitability of a web-based support system for pupils.

Phase	Design	Sampling methods	Participants	Paper
Phase I	Descriptive qualitative study	Purposive sampling	Teaching staff (N=16)	Paper I
Phase I	Descriptive qualitative study	Purposive sampling	Teaching staff (N=8)	Paper II
Phase II	A cross-sectional descriptive study	Total sampling	School nurses (N=136)	Paper III
Phase III	Descriptive mixed-methods study	Purposive sampling (school) Total sampling (class)	8th grade pupils (N=21)	Paper IV

4.4   Instruments

In Phase I, first, semi-structured focus group interviews were conducted with four items for the participants to address. Focus group interviews involve the interaction within a group to elicit rich experiential data, and the aim of items was to gain a better understanding of what kinds of situations are challenging for teaching staff. Moreover, their needs for support, knowledge, and skills were studied. (Jayasekara et al. 2012.) The items in the interviews were: 1) Please describe what kind of knowledge is needed in managing challenging situations with pupils at school, 2) Please describe what kinds of skills are needed in managing challenging situations with pupils at school, 3) Please describe what kind of support is needed in managing challenging situations with the pupils, and 4) Do you have suggestions to improve the current situation at school?

Second, an eLearning course for teaching staff was developed with the aim of support their ability to manage challenging situations with pupils and to promote mental health in schools by offering education to teaching staff. The results of focus groups were utilised when developing the content of the course, and an earlier eLearning course for nurses used as framework for the course. The earlier eLearning course aimed at managing patients' challenging behaviour in mental health care. Earlier studies had already shown that the course was effective in managing challenging situations and in changing practices in mental health care. (Kontio et al. 2011, Lahti et al. 2014.) The framework of the course was adapted to an eLearning course for teaching staff. The reflective writings for the eLearning course were structured by Gibbs' (1988) model of the reflective cycle. It consists of six stages guiding the reflective process: "1) Describe what happened without any conclusions at this point in time, 2) Describe your reactions and feelings during and after the experience, 3) Evaluate the situation; what was good or bad in the situation, 4) Analyse the situation; what sense you can make of the situation, 5) Conclude; what else could you have done in the situation, 6) Make an action plan; if the situation happened again, what would you do?" (Gibbs 1988). During the course, participants were asked to write about the challenging situations they had experienced with pupils. They were asked to structure their writings with Gibbs' reflective cycle and integrate their reflections using course material (Paper II).

In Phase II, the instrument Mental Health Needs and Practices in Schools Survey was used for collecting data from school nurses. The instrument was developed and validated in the US (Reinke et al. 2011, Stormont et al. 2011). The instrument was translated with back-translation method with a professional translator. First, researchers translated all the items from their original English to Finnish. Then a professional translator translated the instrument back to English. After that, the agreement between the original and back-translated versions was considered, and the translation process continued until the translated version was close enough to the original survey instrument. (Maneesriwonggul & Dixon 2004.) The original survey instrument included 42 questions, and 29 questions relevant in a Finnish context and to the work of school nurses were used. When the back-translated version was considered close enough to the original survey instrument, the developer confirmed the translated instrument and its cultural adaptation.

In Phase III, pupils were screened for depressive symptoms two times during the support system by using the Beck Depression Inventory's (BDI-21, Beck et al. 1961) Finnish version (Nuevo et al. 2009). A structured questionnaire with 38 questions with a 5-point Likert-scale (1=fully disagree to 5=fully agree) was used for gathering adolescents' feedback about the web-based support system. The questionnaire had questions focusing on the content, functionality, appearance, usage, quality of the information and tasks of the support system. The instrument is

based on the Quality Criteria of Public Online Services (The Finnish Ministry of Finance 2004) and the Quality Criteria for Health-Related Websites (Commission of the European Communities 2002). It has been modified and used among adolescents in earlier studies (Anttila et al. 2020a). Further on, minor modifications were done in this study.

4.5   Data collection

In Phase I, first, the data were collected in April 2013 in two focus group interviews for teaching staff (9 and 7 participants in each group) (Paper I). Focus groups were used to explore participants' views and opinions. The participants were able to discuss their opinions and ideas about the topic (Jayasekara 2012). The interviews were conducted in a school environment. The participants were given written and verbal information on the study. Written informed consent was received from all participants and their background information was collected in written format. After filling in the background information forms, the participants were asked to individually write a short description about a challenging situation they had experienced with pupils. The purpose of the writings was to stimulate discussion. The interviews were audio-recorded, and there were two interviewers present. One interviewer handled the recording, and the other focused on the discussion during the interview. The recorded interviews lasted altogether 1 hour and 14 minutes (30 and 44 minutes each).

Second, (Paper II) the data were collected from the eLearning course, which was held between September 2013 and March 2014 for teaching staff. After the course, the participants were informed about the study, and altogether 8 participants completed the course and gave permission to use their writing as research data. The data were derived from the reflective writings that participants wrote during the course. The participants returned their writings via the eLearning platform and the data were copied from there. Altogether 36 writings were included.

In Phase II, The data were collected between 3 April and 1 June 2018. The invitation emails with information about the study were sent to all the members of The Finnish Association of Public Health Nurses working as school nurses. The emails were sent by the association. Those who were willing to participate were instructed to access to electronic survey. After the first invitation, altogether five reminder emails, and two reminders by the association through Facebook were sent.

In Phase III, the data were collected in spring 2014. Pupils used a web-based support system (Depis.Net) on iPads or laptops during weekly scheduled school classes. Depis.Net is a web-based support system and it was originally developed for adolescents with symptoms of depression. It aims to support adolescents' self-management skills and improve their knowledge about mental health and wellbeing

related to depression. (Välimäki et al. 2012.) The theoretical framework of Depis.Net is based on the self-determination theory (Ryan & Deci 2000) The intervention consisted of six weekly sessions: 1) Introduction, 2) Well-being, 3) Home and family, 4) Adolescents rights and responsibilities, 5) Adolescents' depression, 6) Treatment of adolescents' depression. The background information of pupils was collected. The number of accesses to each module by each adolescent and the number of returned tasks were calculated. Their presence in classroom sessions was also recorded. The pupils' depressive symptoms were screened with the BDI-21 questionnaire two times (week 3 and week 6). The feedback of the support system was collected at the end of each classroom session; adolescents gave written feedback and a grade evaluation (4–10) for each separate module and the whole support system. Pupils indicated whether they would recommend each module and the support system as a whole to their friends. In the last session, participants completed a structured feedback questionnaire.

4.6   Data analysis

In Phase I, the data from the focus group interviews (N=16) and short writings were analysed using qualitative inductive content analysis (Paper I) (Graneheim & Lundman 2004). This method was used to ensure that participants' perceptions were derived from the data and because it is useful for analysing individuals' or groups' perceptions and experiences (Polit & Beck 2010). Inductive content analysis is a systematic analysis method for written or verbal communication. The audio-recorded interviews were transcribed into written format and analysed with participants' written descriptions of challenging situations. (Graneheim & Lundman 2004). The unit of analysis was selected to be a phrase or a descriptive paragraph answering the research question. The codes were generated from the data as the analysis units were abstracted and labelled with codes (Sandelowski 2000). Codes were combined into subcategories according to differences and similarities. Finally, the main categories were developed by grouping together the subcategories with similar meanings.

The reflective writings (N=36) were analysed with a combination of deductive and inductive analysis (Paper II). The Gibbs' reflective cycle was used for the thematic main categories (Hsieh & Shannon 2005, Vaismoradi 2013). First, from all the reflective writings, the parts answering the first question in Gibbs' cycles, "What happened?", were gathered together and analysed with inductive content analysis. The procedure continued similarly through all the stages of Gibbs' reflective cycle. (Vaismoradi 2013). Inductive content analysis was used for analysing the data within the main categories from the deductive phase for ensuring that participants' reflections were derived from the data (Hsieh & Shannon 2005, Sandelowski 2000).

In Phase II, the data from the survey for school nurses (N=136) were first analysed using descriptive statistics (frequencies, percentages, means, standard deviations [SD]) (Paper III). The data were analysed using SPSS version 25 (SPSS IBM, New York, USA). The qualitative data were categorised using manifest content analysis and interpreted into numerical data. (Hsieh & Shannon 2005). The answers were analysed by coding the data manually and creating categories and calculating items in each category.

In Phase III, the number of accesses into the web-based support system, number of adolescents' presence in the classroom, number of returned tasks and yes-no answers to the question of recommending the topic to friends were calculated and analysed using descriptive statistics (frequencies, mean, SD, median, range). The Chi^2 test of independence was performed to detect any differences in the number of logins between boys and girls. The feedback questionnaire was analysed by calculating the answers for specific sub-categories (the content, functionality, presentation, usage, quality of information, tasks), which were analysed using descriptive statistics, and then girls' and boys' feedback were analysed separately. (Tappen 2016). Version 26 of the statistical software was used (SPSS IBM, New York, USA). Grade evaluations were analysed by recategorising the grades (4–5, 6–7, 8–9, 10), and individual modules and the whole support system were analysed using frequencies and ranges.

The qualitative data from the open-ended questions were analysed with deductive content analysis (Hsieh & Shannon 2005). The data were categorised using the same categories as in the survey instruments (the content, structure, presentation, usage, information). Answers were categorised into a matrix to represent opinions and ideas shared in response to the questions.

The methods of data collection, year of data collection and methods of data analysis in each phase and paper are described in Table 2.

Table 2. The methods and year of data collection and data analysis in each phase and paper.

	Data collection	Data collection year	Instruments	Data analysis method	Paper
Phase I	Semi-structured focus group interviews	2013		Inductive content analysis	Paper I
Phase I	Reflective writings from an eLearning course platform	2013-2014		Combination of deductive and inductive content analysis	Paper II
Phase II	An electronic survey	2018	Mental Health Needs and Practices in Schools Survey[1]	Descriptive statistical analysis and Manifest content analysis	Paper III
Phase III	Number of accesses, returned tasks, and attendances. Written feedback and numeral evaluations. BDI-21 in weeks 3 and 6. Structured feedback questionnaire.	2014	BDI-21[2] Feedback questionnaire	Descriptive statistical analysis and Deductive content analysis	Paper IV

[1] Stormont et al. 2011, Reinke et al. 2011.
[2] Beck 1961

4.7   Ethical considerations

Good scientific practices and the principles for medical research and legislation were adhered to in every phase of the study (Varantola et al. 2012, WMA 2013). Informed consent was requested from every participant or from the guardians of participants younger than 15 years old (the Finnish Medical Research Act 488/1999). Participants were able to contact researchers for further information. The participants were informed about the option to withdraw at any time. All personal information remained confidential, and it was reported in such way that anonymity of participants was ensured. The data were accessible only to the researchers (Varantola et al. 2012, WMA 2013).

   In Phase I, first, approval of the study was obtained from the principal of the school (19.4.2013, §75) (Paper I). In the focus group interviews, the participants met each other, but the individually written descriptions were collected anonymously. Second, approval of the next study was obtained from the municipal educational administration and the principal of the school (Paper II). During the eLearning course, only mentors of the course read the participants' individually written reflective writings. Participants wrote about very personal experiences. Therefore,

the results were reported in such a way that the possibility of participants recognising each other was minimised.

In Phase II, the study proposal was evaluated by the Ethics Committee of the University of Turku (5/2018). The permission to conduct the study was granted from (7 March 2018). The association sent the invitations via emails, and email addresses of the potential participants were not revealed to researchers. The permission to use the survey instrument was granted by the developer of the instrument. The background questions were formulated in such a way that the participants' anonymity was ensured. The modifications of the survey instrument were approved by the developer of the instrument.

In Phase III, the study proposal was evaluated by the Ethics Committee of University of Turku, (21/2014) and an approval of the study was obtained from the city where the study was run (NRO 86/2014). Special efforts for ensuring adolescents security and privacy issues were made. A specific information session was held to share oral and written information about the study with adolescents. Moreover, a specific protocol for identifying concerns and for supporting adolescents who needed help (e.g., high BDI-21 scores, suicidal ideations) was developed together with a school nurse and a teacher. The results were discussed first with adolescents, and with the adolescent's permission, they were also discussed with the school nurse. The school nurse registered the discussion in the pupil's health records and proceeded according to the health care protocol used in Finland (Government Decree 338/2011).

5 Results

5.1 Characteristics of the participants

In Phase I, the participants were teaching staff working with pupils of different ages (grades 1–9). First, the focus group participants (N=16) comprised eight teachers (classroom teachers, subject teachers or special education teachers) and eight classroom assistants. Out of the 16 participants, one was male and the rest were female. Their ages varied from 23 to 59 years (mean 39.75, standard deviation (SD) 9.66). The length of their working experience ranged from 1 to 20 years (mean 8.50, SD 7.43).

Second, after the eLearning course (N=8), four classroom assistants and four teachers (special education teachers, classroom teachers and subject teachers) gave their permission to use their writings as research data. Because the sample size was small, detailed background information was not collected, for ensuring the anonymity of the teaching staff.

In Phase II, the participants (N=136) were school nurses. Their ages ranged from 24 to 64 years (mean 47.39, SD 10.49). Almost all (n=134, 99%) were females. The number of years since they had become qualified as a public health nurse ranged from 0 to 42 years (mean 18.5, SD 10.64). Most of the participants (n=118, 91%) had a bachelor's degree, and less than one-tenth had a master's degree. Working experience in school nursing ranged from 0 to 37 years (mean 13.48, SD 8.53). Participants worked at all school levels, most often in primary schools (n=77, 57%).

In Phase III, the participants (N=21) were pupils from one eighth grade class. Twelve (57%) out of 21 participants were 15 years old, and nine (43%) were 14 years old. Nine were boys (43%) and 12 were girls (57%).

The Participants and setting in each phase and paper are described in Table 3.

Table 3. The Participants and setting in each phase and paper.

	Participants	N	Setting	Paper
Phase I	Teaching staff (teachers, special education teachers and classroom assistants)	16	Comprehensive school	Paper I
Phase I	Teaching staff (teachers, special education teachers and classroom assistants)	8	An eLearning course for teaching staff in comprehensive school	Paper II
Phase II	School nurses	167	School/Student health care	Paper III
Phase III	Pupils (8th graders)	21	Comprehensive school	Paper IV

5.2 Teaching staff's perceptions and capacities in supporting pupils' mental health

Teaching staff work closely with pupils and were thus able to describe their concerns about pupils' mental health and the challenging situations they face with pupils. They described concerns related to pupils' behaviour, mood and insecurity about how to educationally support pupils with mental health problems. (Paper I, II.)

The teaching staff described pupils externalising challenging behaviour, such as impulsive, restless and unpredictable behaviour (Paper I). Pupils were found to sometimes have difficulties concentrating on school activities or act in a physically or verbally aggressive way towards teaching staff or peers (Paper I, II). Pupils could oppose the teacher's instructions by refusing to do schoolwork or not obeying the rules (Paper I, II). Socially withdrawn behaviour was described as alienating from peers, not sharing one's feelings or thoughts, passive aggression or having difficulty making contact with a pupil (Paper I, II). Withdrawn behaviour may occur when pupils are disappointed, for example, in their own performance in schoolwork or after a conflict situation with a peer (Paper II). Moreover, teaching staff had concerns about bullying situations and conflict situations between pupils (Paper I, II).

Teaching staff described difficulties in understanding the reasons for pupils' worrying behaviour and having difficulties in anticipating challenging situations with pupils (Paper I, II). They expressed wanting to have better knowledge about issues affecting pupils' mental health and behaviour (Paper I, II) as well as better knowledge and skills in recognising pupils' mental health problems and in evaluating their mental health (Paper I). Teaching staff also wanted to have a better understanding of how to support pupils with mental health problems in their learning and schooling. For example, more knowledge about neuropsychiatric problems such as ADHD or the autism spectrum was desired so that these pupils could be better supported (Paper I, II). Being aware of pupils' special needs was considered to be

helpful (Paper I, II), and sometimes staff were missing important information about a pupil due to lack of communication between members of the teaching staff and other professionals in the school (Paper I).

Teaching staff described the importance of seeing the person behind the misbehaviour and handling challenging situations with pupils in ethically correct ways (Paper II). Difficulties in handling challenging situations included, for example, teaching staff reacting too aggressively to a pupil's behaviour or staff not being able to interact with a pupil (Paper II). Learning to reflect on their experiences, feelings and reactions was considered to be easier after gaining more working experience and getting to know the pupils (Paper II). Teaching staff tried to understand the triggers for pupils' behaviour and wanted to understand challenging situations from the pupils' point of view (Paper II).

5.3 School nurses' perceptions and capacities in supporting pupils' mental health

School nurses work with pupils with mental health needs constantly. They were asked if they had worked with pupils with symptoms of mental disorders, during the past school year. Most often, school nurses reported working with pupils with concentration problems (n=135, 99%), depression (n=134, 99%) anxiety (n=131, 96%) and family stressors (n=129, 95%). With an open-ended question, school nurses were asked what they felt were the most concerning mental health problems in their school, and the most commonly mentioned problems were depression and suicidal ideation and behaviour (n=132, 98%), anxiety including panic disorder (n=106, 79%) and behavioural problems such as aggressive, disruptive or impulsive behaviour (n=62, 46%). (Paper III.)

Within the last year, most of the school nurses, 122 (90%) had referred pupils to mental health services, and 92 (68%) had referred families. School nurses reported that barriers to supporting pupils' mental health in schools were lack of preventive interventions for pupils with internalising behavioural problems, or for pupils with extrovert behavioural problems. Moreover, difficulties in referring pupils to mental health services and an insufficient training for supporting pupils with mental health problems in schools were considered as barriers. (Paper III.)

According to the results of the survey for school nurses, supporting pupils' mental health is an essential part of school nurses' work. Most of them agreed (n=65, 49%) or strongly agreed (n=62, 47%) that their role in ensuring that pupils' mental health problems are recognised is important. School nurses indicated that they have an adequate level of knowledge and skills for supporting pupils' mental health, but they expressed the desire for more knowledge and training about instruments and interventions for supporting and/or evaluating pupils' mental health. About one-third

of the participants felt that their cultural knowledge and skills were insufficient for supporting the mental health of culturally diverse pupils. Participants were asked to name the three main challenges in a school nurse's work in an open-ended question. The most often mentioned were lack of time and feeling pressure (n=72, 55%), a lack of options for sending pupils to mental health services (n=61, 47%) and pupils' family issues (n=32, 27%) (Paper III.)

Teaching staff's and school nurses' concerns related to pupils' mental well-being and needs for knowledge and training are presented in Table 4.

Table 4. Teaching staff's and school nurses' concerns related to pupils' mental well-being and needs for knowledge and training.

	Main concerns	Needs for knowledge and training
TEACHING STAFF	Behavioural problems Emotional problems Bullying Conflicts with peers	Better understanding about pupils' behaviour Skills to recognise pupils' mental health problems Skills to support pupils' health Knowledge about neuropsychiatric problems
SCHOOL NURSES	Suicidal thoughts and behaviour Anxiety and panic disorders Behavioural problems Other mental health problems	Instruments for assessing pupils' mental health Training in interventions for supporting pupils' mental health Better knowledge about supporting culturally diverse pupils' mental health

5.4 Pupils' usage of the web-based support system

The participants actively used the web-based support system. Most of the pupils (71%) were involved in using the support system and participated in the classroom sessions at the end of the program. The classroom sessions were scheduled during a school day, but pupils were able to choose alternative activities and there were no consequences if they chose not to participate in the classroom session. This way, their voluntary participation was ensured and their interest in using the web-based support system was assessable. The pupils used the program in the classroom independently, and a tutor specialised in mental health nursing was always present to ensure individual support if needed.

The web-based support system consisted of five modules: 1) Well-being, 2) Home and Family, 3) Adolescents' Rights and Responsibilities, 4) Adolescents' Depression, and 5) Treatment of Depression. The number of logins into the support system ranged from 4–62 (mean 25, median 23). Based on the number of logins for each module, the most popular topic was adolescents' depression (mean 7.76, SD

6.18). The pupils were asked to complete the BDI-21 questionnaire two separate times. First, 17 participants filled it out, and later 13 participants filled it out. Three of the participants had symptoms of moderate depression, and the rest of the pupils did not report symptoms of depression. The number of logins indicated that pupils with no symptoms of depression were also interested in the topic. (Paper IV.)

The content of the web-based support system aimed to enhance pupils' mental health literacy on mental health, depression and treatment of depression. At the end of each classroom session, pupils were asked to indicate if they would recommend each module to a friend. The most often recommended modules were Treatment of Depression (14/14, 100%), Adolescents' Depression (16/17, 94%) and Home and Family (17/19, 89%). In the feedback questionnaire, adolescents gave an overall good grade to the support system (score 8–9, 59%–88%). The topic of Adolescents' Depression got the highest ratings, and lowest ratings were given to Health and Well-being. The content of the support system was assessed to be relevant for adolescents, and the opportunity to reflect their own thoughts and feelings was considered to be important. Pupils gave positive written feedback on the information in the support system and being able to focus their reflections on specific topics. Pupils' suggestions to improve the support system were related to structure and presentation and to specific assignments. They suggested a clearer outlook and structure, more colours and pictures and more funny cartoons. (Paper IV.)

The web-based support system helped identify pupils in need of professional help or whose mental health should be assessed. During the data collection, worries about three pupils were discussed, and the pupils were referred to a school nurse, according to the study protocol. (Paper IV.)

5.5   Summary of the main results

The aim of this study was to describe pupil's mental health needs at school from different perspectives. In **Phase I**, teachings staff's perceptions and capacities in supporting pupils' mental health were described. Teaching staff described their concerns related pupils' mental health and their difficulties in managing challenging situations with pupils.

In Phase II, school nurses' perceptions and capacities in supporting pupils' mental health were described. School nurses reported working with pupils with mental health needs constantly. Their main concerns, barriers for supporting pupils' mental health and needs for knowledge and training were described.

In Phase III, pupils' usage of the web-based support system and its suitability for supporting pupils' mental health in school was evaluated. Pupils used the support system actively and it helped to identify pupils with needs for mental health support. The main findings of the present study are summarized in Table 5.

Table 5.   Summary of the main results.

Phase	Main results
PHASE I	**Teaching staff described:** - Concerns related to pupils' behavioural problems, socially withdrawn behaviour, pupils having difficulties in concentrating, bullying and conflict situations between pupils - Difficulties in understanding reasons for worrying behaviour **Teaching staff's needs for knowledge and training:** - Knowledge about issues affecting pupils' mental health and behaviour - Knowledge and skills in recognising pupils' mental health problems - How to support pupils with mental health problems
PHASE II	**School nurses reported:** - Most concerning mental health problems among pupils: depression and suicidal ideation and behaviour, anxiety and behavioural problems. -Barriers for supporting pupils' mental health: lack of interventions, difficulties in referring pupils to mental health services and lack of time - Having an adequate knowledge and skills for supporting pupils' mental health **School nurses' needs for knowledge and training:** - Instruments for assessing pupils' mental health - Interventions for supporting pupils' mental health - Knowledge about supporting culturally diverse pupils' mental health
PHASE III	- Pupils used the web-based support system actively - Pupils adherence was good, 71% of them participated until the end. - The content of the support system was assessed to be relevant for the adolescents - The most popular topic was adolescents' depression, even though most of the participants did not have symptoms of depression - Opportunity to reflect own feelings and thoughts was considered to be important - The web-based support system helped to identify pupils in of professional help

6 Discussion

6.1 Discussion of main results

6.1.1 Teaching staff's perceptions

In the present study, the teaching staff's perceptions on pupils' mental health were described. The results showed that the teaching staff's concerns were often related to pupils' behaviour and mood and challenging situations with the pupils. In previous studies, teachers have reported that pupils getting off-task and behaving disruptively are the most common behavioural problems, and teachers have difficulties in managing them (Alter 2013, Crawshaw 2015, Sullivan et al. 2014).

In the present study, teaching staff reported having difficulties in understanding the reasons for pupils' concerning behaviour, and they expressed the desire to have better knowledge and skills in recognising pupils' mental health problems and how to educationally support pupils with mental health problems. These results were supported by previous studies, as teachers have reported that they consider supporting pupils' mental health to be important, and they feel a responsibility to offer pupils that support. However, they may feel unsure about how to recognise mental health needs and how to best help pupils in this regard (Ekornes 2016, Graham et al. 2011, Sisask et al. 2014).

Supportive interactions and positive teacher-pupil relationships support pupils' mental health in school environments (Krane et al. 2011, Graham et al. 2016). In the present study, teachers were able to reflect on their experiences. They described the importance of seeing the person behind the misbehaviour and wanted to handle challenging situations in an ethically correct way. The teachers reflected on their successes and failures in dealing with challenging situations and tried to understand the challenging situations from the pupils' points of view.

6.1.2 School nurses' perceptions

The results in the present study showed that school nurses identify pupils' mental health needs and support pupils with mental health problems. In the survey of school nurses, 99% of them reported working with a pupil with concentration problems

within the last year, 99% had worked with a pupil with symptoms of depression and 96% with a pupil with symptoms of anxiety. They felt that they had an important role in ensuring that pupils' mental health problems are recognised. The importance of the role of school nurses in supporting pupils' mental health is supported by earlier studies. They also may provide brief interventions and refer pupils to mental health services when needed (Bohnenkamp et al. 2015, Ellertsson et al. 2017, Jönsson et al. 2019, Pryjmackhuk et al. 2012, Skundberg-Kletthagen & Moen 2017, Ravenna & Cleaver 2016).

In the present study, school nurses indicated that they have an adequate level of knowledge and skills for supporting pupils' mental health. This may indicate that Finnish school nurses' education is adequate regarding the mental health of pupils. In a previous qualitative study, school nurses were quite satisfied with their education, but indicated that they needed more training in pupils' mental health and development (Anttila et al. 2020b). In previous studies, school nurses have reported feeling unsure about their knowledge related to pupils' mental health (Haddad et al. 2018, Skundberg-Kletthage & Moen 2017, Pryjmachuk et al. 2012). This lack of confidence may be due to insufficient training for school nurses in mental health issues (Pryjmachuk et al. 2012). School nurses with training and further education in mental health have reported feeling more confident (Moen & Skundberg-Kletthagen 2018).

In the present study, school nurses indicated that the main challenges in their work were a lack of time and resources and a lack of mental health interventions, in terms of supporting and assessing pupils' mental health. School nurses wanted training in mental health interventions. These results are similar to those of previous studies; school nurses would like to have the clinical supervision and workload that leaves time for them to support pupils' mental health and implement interventions (Anttila et al. 2020b, Moen & Skundberg-Kletthagen 2018, Muggeo & Ginsburg 2019, Pryjmachuk et al. 2012).

6.1.3   The suitability of the web-based support system

In the present study, pupils used the web-based support system actively. The pupils were given the opportunity to choose an alternative activity or go home, so their participation during school days was voluntary. The usage of the support system was measured by calculating the number of logins to the program and each module, the number of tasks completed, and the number of pupils present in the classroom session. In previous studies, adherence to the program has been evaluated on the basis of completed modules of an intervention (Shum et al. 2019, Calear et al. 2016).

In the present study, the pupils' usage of the web-based support system was supported with scheduled classroom sessions, a mental health professional present

at each classroom session, and support from a teacher. Pupils' adherence to the program was good, as 71% of them were involved and participated until the end. In a study by Shum et al. (2019), a combination of online digital game-based lessons and classroom lessons were used to support adherence to the program; 68.9% of pupils reached the completion rate of 50% and 31.1% completed 50%. In a study by Calear et al. (2016), in an intervention supported by teachers, 78% adhered for the first two weeks, 43% for four weeks and 36% for all six weeks. Pupils in mental health services adhered significantly more to the program; 87% completed two weeks, 65% completed four weeks and 50% completed all six weeks of the program (Calear et al. 2016.) In a present study, the combination of different factors to support pupils' adherence may be one reason for the good result.

The present study evaluated the usage and the suitability of the Depis.Net program as a school-based universal mental health promotion intervention. Calear et al. (2016) have previously tested the effectiveness of a universal preventive intervention for generilised anxiety aimed at upper secondary school pupils. No significant positive effects on participants' mental health or symptoms of anxiety and depression were found. Therefore, more research on school-based web-based universal interventions for promoting pupils' mental health is needed, focusing on what type of interventions are effective and how targeted interventions should be modified if they are used as universal school-based interventions.

6.1.4 The ecological model and the present study

The ecological model was used to guide in the understanding of which aspects in the school environment may influence pupils' mental health (Bronfenbrenner 1977). The present study focused on pupils' microsystem in schools. According to ecological model, pupils' interactions with their environment influence their development and mental health (Bronfenbrenner 1977, Macklem 2014). Therefore, mental health promotion in schools should focus both on pupils and on adults working with them. The present study focused on pupils' as well as teaching staff's and school nurse' perceptions and capacities in supporting pupils' mental health.

In the present study, teaching staff described having difficulties in understanding the reasons for pupils' concerning behaviour. They expressed the desire to have better knowledge about issues affecting pupils' behaviour and skills to anticipate challenging situations. Teaching staff felt that it is important to handle the challenging situations with pupils in ethically correct ways and not to response too aggressively to a pupils' behaviour. They hoped for knowledge and training about issues affecting pupils' behaviour and mental health. The importance of interactions between teaching staff and pupils is supported by ecological model. Especially

pupils with mental health problems need understanding adults in everyday situations in schools.

In the present study, school nurses indicated having an adequate level of knowledge and skills for supporting pupils' mental health, but they hoped for tools and interventions. School nurses reported that they lack of time to support pupils' mental health. School nurses' role in supporting pupils' mental health is essential as they meet all the pupils in health examinations and pupils visit school nurses with wide range of concerns. School nurses are able to interact with pupils with mental health needs, but they lack of time and resources. Mental health support for pupils could be strengthened by offering education and adequate resources for school nurses.

Pupils usage of the web-based support system in school environment was supported by scheduled classroom sessions and support from teacher. The implementation of the web-based support system in school environment supported pupils' adherence. The pupils with need of professional help or whose mental health should be assessed were recognised. The web-based support system is one way to strengthen mental health support for pupils in schools and to improve recognition of those pupils in need for mental health support.

6.2   Validity and reliability of the study

In this study the multi-method approach was used, reliability and validity were evaluated in quantitative study phase, and the quality of the research process was evaluated with standards of trustworthiness in qualitative study phases (Polit & Beck 2010). The trustworthiness of qualitative research is reflected in its credibility, conformability, dependability, and transferability (Elo et al. 2014, Graneheim & Lundman 2004, Polit & Beck 2010).

In Phase I, a descriptive qualitative study design was used. Credibility refers to confidence in the truth of the data and that it is presented from the participants' point of view (Graneheim & Lundman 2004, Polit & Beck 2010). The credibility of the study was ensured by choosing the most suitable data collection methods for gaining answering the specific resaearch questions (Elo et al. 2014). The data were collected through focus group interviwes (Jayasekara 2012) and reflective writings by the teaching staff during an eLearning course. To ensure the credibility of the collected data, the study samples consisted of participants with experiences of working with pupils with mental health needs. The participants were from different professional backgrounds (teachers, classroom assistants, special education teachers) and worked with pupils from the first through ninth grades of a comprehensive school. This way it was possible to gain information from different perspectives about the situations with the pupils during school days (Graneheim & Lundman 2004). In focus groups,

the sampling may have been biased towards those who were prepared to discuss the topic with other members of the teaching staff from the same school. The sample of participants in the eLearning course may have also been biased because all the participants had completed the eLearning course. They may have been more motivated to support pupils with mental health needs and in professional development than those who did not complete the course. (Graneheim & Lundman 2004.)

Conformability refers to the objectivity of the data. It is important that findings reflect participants' perceptions. (Graneheim & Lundman 2004, Polit & Beck 2010.) The data were analysed with inductive content analysis, a method for which the data should be as unstructured as possible (Graneheim & Lundman 2004). The focus group interviews with semi-structured questions produced rich data as participants were able to discuss and elicit thoughts and ideas (Jayasekara 2012). To support objectivity, there were two researchers present at the interviews; one handled the recording and made notes and the other concentrated on the content of the interview. Later, teaching staff described their experiences and reflections in writings, and the data analysis was a combination of deductive and inductive analysis. The Gibbs' reflective cycle was used as a framework for the data analysis. This enables readers to follow participants' reflection process. During both inductive content analysis processes, the data were first coded and categorised by the first author. Then the results were discussed and resolved with co-authors. (Graneheim & Lundman 2004.) To ensure conformability, the analysis process was described carefully so other researchers could follow it (Polit & Beck 2010).

Dependability refers to the stability of the data over time and across different contexts (Polit & Beck 2010). To support the dependability, the research process of this study was reported as well as the study context and eLearning course. This enables other researchers to follow the research procedures.

Transferability refers to the extent to which findings can be transferred to or are applicable in other contexts (Elo et al. 2014, Graneheim & Lundman 2004, Polit & Beck 2010). This study was conducted at one comprehensive school, and the samples were small, which can be seen as a limitation (Graneheim & Lundman 2004, Polit & Beck 2010). However, the results of the study can provide insights for further research and development of practices in schools, even though they are not intended to be generalisable to other schools. To support the transferability, the study context and participants were described. Moreover, the procedure of the data collection and further the data analysis process were explained and the findings were presented with the appropriate quotations. (Graneheim & Lundman 2004, Polit & Beck 2010).

In Phase II, a descriptive quantitative study design was used and a survey of school nurses was conducted. The data were collected with the Mental Health Needs and Practices in Schools Survey, an instrument developed and validated in the US

(Reinke et al. 2011, Stormont et al. 2011). The original survey instrument was translated with back-translation method with a professional translator. First it was translated the original English to Finnish. Then, a professional translator back-translated it from Finnish to English, without seeing the original version. The translation process continued until the translated version of the survey instrument was considered similar enough with the original version. (Hilton & Skrutkowski 2002, Maneesriwonggul & Dixon 2004.) Some modifications to the survey instrument were made to ensure its usability for Finnish school nurses. The back-translated version was sent to the developer to confirm the translated version with modifications.

The face validity of the survey instrument was evaluated by pre-testing it with school nurses (N=4) working in primary and secondary schools. Based on the pre-test, the survey instrument was understandable, and the questions were relevant to the work of school nurses in Finland. The reliability of the survey was evaluated using Cronbach's alpha in applicable sub-scales. Cronbach's alpha measures the internal consistency of the instrument, the extent to which the Likert items of the instrument measure the same construct (Polit & Beck 2010). When the Cronbach's alpha is above 70, it is considered acceptable (Taber 2018). In this study, the internal consistency of the sub-scales was considered good. The Cronbach's alpha for the sub-scale related to the extent participants felt that teachers should be involved in addressing pupils' mental health needs was 0.71. For the sub-scale about barriers to providing pupils' mental health services in schools, the Cronbach's alpha was 0.89, and for the sub-scale related to reasons why pupils with mental health needs might not get the help they need, the Cronbach's alpha was 0.86.

The response rate of the survey was only 21% (N=136), and therefore, the sample may have been biased towards school nurses who were more aware of pupils' mental health issues and more motivated to support pupils' mental health (Polit & Beck 2010). However, the participants were from throughout Finland and worked with, and were responsible for approximately 80,000 pupils in all school levels. With the wide range of school levels (primary school to university) and a low response level, only descriptive statistical analysis was possible. The role of school nurses varies so greatly depending on the age they work with that it is difficult to draw conclusions.

In Phase III, the web-based support system was evaluated in a school setting and mixed methods were used for gaining an understanding of adolescents' usage and adherence of the web-based support system. The use of both quantitative and qualitative data collection and analysis methods can be considered as a strength of this study (Fetters et al. 2013). The adolescents' usage of the web-based support system was assessed by collecting technology usage data: the number of logins, number of participants present in each session and number of completed tasks. The feedback on the support system was collected in various ways: questionnaires,

written feedback and numeral evaluations. Using more than one method made it possible to provide more profound knowledge about the adherence of participants (Sieverink et al. 2017).

The BD1-21 questionnaire for symptoms of depression was used as a tool to assess the well-being of participants during the intervention (Beck 1961). The scale has been validated for adolescents (Stockings et al. 2015) and to be used in Finnish (Nuevo et al. 2009). There were only 21 participants, and therefore, the effects of the intervention were not the aim of the study or the BDI-21 questionnaire. The feedback questionnaire has been used before in earlier studies on Depis.Net (Anttila et al. 2020a), The questionnaire is based on the Quality Criteria of Public Online Services (The Finnish Ministry of Finance 2004) and the Quality Criteria for Health Related Websites (Commission of the European Communities 2002). We made minor modifications to adapt it to a school context.

The small sample size with 21 participants is a limitation for statistical analysis; the results are not generalisable outside the specific class or school. However, only one pupil refused to participate within the class, so this study may represent a typical eighth grade class.

The dependability of the study was ensured by a detailed description of the setting and the intervention, and the credibility was ensured by choosing most suitable data collection methods for gaining information about the pupils' usage and feedback on the support system (Elo et al. 2014). This was ensured by mixed-methods data collecting (Fetters et al. 2013). The qualitative data were analysed using deductive content analysis, and the data from open ended question were categorised with the same categories as in the feedback questionnaire. The different data collection and analysis methods were triangulated, and as both methods gave information on same support system, the categories were suitable for both data analyses. One author categorised the qualitative data, and then it was approved by other authors to enhance validity. (Graneheim & Lundman 2004, Polit & Beck 2010.)

6.3   Implications of the study

The findings of the present study highlight the importance of support for pupils' mental health in schools. School has a significant impact on pupils' mental health, and teaching staff and school nurses play key roles in supporting pupils' mental health. Web-based mental health interventions have shown promising results in school environments, but more research on their effectiveness and how to support pupils' usage of the interventions is needed. More specifically, implications for practice suggested by the findings of the current study are discussed in this section.

Implications for practice

The present study shows that teaching staff constantly face challenging situations related to pupils' mental health needs in their work. They are motivated in supporting pupils' mental health. Pupils with mental health problems are also entitled to learn and study, and the role of teachers in supporting their schooling and mental health is important. Therefore, teaching staff should get support and training on pupils' mental health, as they have expressed a wish for.

The present study shows that the full potential of school nurses is not used in schools for pupils' mental health support. School nurses lack the time and resources to properly support pupils' mental health. Finnish school nurses seem to also be well educated on mental health issues, and they may have potential for wider mental health promotion, early detection and implementation of preventive early interventions for pupils'with mild mental health problems. The results should be taken into account when making decisions on resources in school and student health care.

The lack of tools for mental health work in schools indicates that school nurses need training for mental health interventions for assessing and supporting pupils' mental health. This should be considered, when and planning pre-service and continuing education for school nurses.

The web-based support system may be one possible tool to support pupils' mental health in schools. The present study evaluated the suitability of the web-based support system for pupils in school settings. The results showed that web-based support system helped to identify pupils' in need for professional help or whose mental health should be assessed. The results of this study can be used when planning school-based interventions, e.g., the actions taken to support pupils' adherence to the support system may be useful.

Future research

More research on mental health support for pupils in schools is still needed. The research should focus on:

- Research on effective educational interventions for teaching staff and school nurses.

- The feedback of the e-learning course for teaching staff about challenging situations with pupils was good. More research on pre-service education and professional education for teaching staff related to pupils' mental health and management of challenging behaviour is needed.

- Effective interventions for school settings should be investigated. Universal mental health interventions for promoting pupils' mental

health, interventions for assessing pupils' mental health and interventions for pupils with mild mental health problems should be studied and implemented in schools.

• Research on how to support the schooling of pupils with mental health problems is needed.

7   Conclusions

Pupils' mental health should be supported in schools. Therefore, knowledge about teaching staff's and school nurses' capacities and needs for support and training, as well as understanding their perceptions related to pupils' mental health needs, is essential for planning and developing support for pupils' mental health in schools. The results of this study showed that teaching staff's main concerns related to pupils' mental health were challenging situations with pupils, due to their behavioural problems, and how to support pupils with mental health problems. Staff were aware of their important role in supporting pupils' mental health and wanted more support and training related to it.

This study showed that supporting pupils' mental health is a central part of school nurses' work. School nurses reported having an adequate level of knowledge and skills for supporting pupils' mental health. They wanted to have more training in instruments and interventions for supporting and assessing pupils' mental health. The main obstacles for supporting pupils' mental health were found to be a lack of interventions and a lack of time.

This study showed that the web-based support system, Depis.Net was suitable as a school-based universal mental health intervention. Pupils used the web-based support system actively and gave positive feedback on it. It was helpful in identifying pupils with needs for mental health support. The classroom sessions for individual usage of the support system, with support from a tutor in the classroom, may have helped pupils adhere to the support system. Pupils assessed the content of the support system as relevant to adolescents.

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Appendices

Appendix 1. Search strategies for teaching staff's and school nurses' perceptions of pupils' mental health and capacities in supporting it.

Pubmed (Medline) English Journal articles Ages 6-12 and 13-19 years 2011-2021	((((school nurse*) OR (teacher*) AND (school[Title/Abstract] AND ((("mental health"[MeSH Terms]) OR (mental wellbeing[Title/Abstract])) OR (mental well-being[Title/Abstract]) AND ((((pupil*) OR (student*)) OR (child*)) OR (adolescent*) AND (((((((capacities[Title/Abstract]) OR (capacity[Title/Abstract])) OR (skill*[Title/Abstract])) OR (abilit*[Title/Abstract])) OR (perception*[Title/Abstract])) OR (perspective[Title/Abstract])) OR (view*[Title/Abstract]))	75
CINAHL Peer reviewed English 2011-2021	TI "school nurse'" OR AB "school nurse'" OR TI teacher* OR AB teacher* AND (TI mental health) OR (AB mental health OR (TI mental well-being OR AB mental well-being) AND (TI capacity OR AB capacity) OR (TI capacities OR AB capacities) (TI (abilities or skills) OR AB (abilities or skills)) OR (TI view* OR AB view*) OR (TI perception* OR AB perception*) OR (TI perspective* OR AB perspective*) AND (pupil* OR student*))	25
ERIC Peer reviewed English 2011-2021	TI "school nurse'" OR AB "school nurse'" OR TI teacher* OR AB teacher* AND (TI School* OR AB School) AND (TI mental health) OR (AB mental health OR (TI mental well-being OR AB mental well-being) OR (TI mental wellbeing OR AB mental wellbeing) AND (TI capacity OR AB capacity) OR (TI capacities OR AB capacities) (TI (abilities or skills) OR AB (abilities or skills)) OR (TI view* OR AB view*) OR (TI perception* OR AB perception*) OR (TI perspective* OR AB perspective*) AND (pupil* OR student* OR adolescent* OR child*)	150
Web of Science English Article 2011-2021	(((ALL=("school nurse*") OR ALL=(teacher*) AND (((ALL=("mental health")) OR ALL=("mental well-being"))) OR ALL=("mental wellbeing") AND (((((((((ALL=(school)) AND ALL=(abilit*)) OR ALL=(skill*)) OR ALL=(capacities)) OR ALL=(capacity)) OR ALL=(abilit*)) OR ALL=(perceptioin*)) OR ALL=(perspective)) OR ALL=(view*)) OR ALL=(perspective)AND ALL=(pupil*)) OR ALL=(student) AND ((ALL=(child*)) OR ALL=(adolescent*))	477
Total		727

Appendix 2. Search strategies for web-based universal interventions for promoting pupils' mental health in schools

Pubmed (Medline) English Journal articles 2011-2021	(("school"[Title/Abstract] OR "schoolbased" [Title/Abstract]) AND ("mental health"[MeSH Terms] OR "mental well-being"[Title/Abstract]) OR ("emotional wellbeing"[Title/Abstract]) AND ("promot*"[Title/Abstract] OR "prevent*" [Title/Abstract]) AND ("web-based"[Title/Abstract] OR "digital"[Title/Abstract] OR "ehealth"[Title/Abstract] OR "mhealth"[Title/Abstract] OR "internet"[Title/Abstract] OR "online"[Title/Abstract] OR "mobile application"[Title/Abstract]) AND ("intervention s"[All Fields] OR "interventions"[All Fields] OR "interventive"[All Fields] OR "methods" [MeSH Terms] OR "methods"[All Fields] OR "intervent*"[All Fields]	31
CINAHL Peer reviewed English 2011-2021	mental wellbeing or mental health AND (promotion or promote or promoting) OR prevention programs OR school based interventions or programs AND digital OR (web-based interventions' or 'e-health' or 'internet-based interventions or telehealth) OR mhealth OR mobile applications OR online AND universal OR primary AND intervention	3
ERIC Peer reviewed English 2011-2021	(mental well-being or positive mental health or mental health) AND school based intervention AND universal OR primary AND (intervention or program) AND (promotion or promote or promoting) OR prevention AND online OR web-based OR (e-health or ehealth or digital health) OR (mhealth or mobile health or m-health or mobile app or mobile application)	2
Web of Science English Article 2011-2021	(((ALL=("mental health")) OR ALL=("mental wellbeing"))) OR ALL=("mental well-being") AND(((ALL=("mental health")) OR ALL=("mental wellbeing"))) OR ALL=("mental well-being") AND (ALL=(promoti*)) OR ALL=(prevent*)AND(ALL=(intervention)) OR ALL=(program)AND(((((((ALL=(online)) OR ALL=(web-based)) OR ALL=(internet*)) OR ALL=(e-health)) OR ALL=(mhealth)) OR ALL=(ehealth)) OR ALL=((mobile app*))) OR ALL=(digital)AND (ALL=(school-based)) AND ALL=(school)	38
Total		74

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