Promoting mental health and preventing loneliness in upper secondary school in Norway: Effects of a randomized controlled trial

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ABSTRACT

The aim of this study was to evaluate the effect of an intervention with a universal program (single-tier) in one group, and the combination of this universal program and a selected+indicated measure (multi-tier) in another group. Intervention designed to enhance the psychosocial environment to reduce loneliness and mental health problems. 17 upper secondary schools in Norway were randomly assigned with six, six, and five schools in the single-tier, multi-tier and control group respectively. An overall increase in mental health problems and loneliness was found in all groups at follow-up. Compared to girls in the control group, girls in the multitier group had a significantly lower increase in mental health problems. Due to small effects, we take caution in interpreting findings.

KEYWORDS; Intervention effects, Adolescents, Mental health, Loneliness, Upper secondary schools, single-tier, multi-tier

Introduction

Adolescents' mental health is a field gaining increasing attention in research, prevention and treatment. In Norway, recent national estimates among 15-16 years old adolescents show that 29% of girls and 10% of boys report high levels of depressive symptoms (Bakken, 2018). Furthermore, 7% of boys and 16% of girls in the first year of upper secondary school report being lonely (Bakken, 2018). Research shows clear associations between mental health problems and absence from school among students in upper secondary education (Anvik & Gustavsen, 2012; Markussen, Frøseth, & Sandberg, 2011; Markussen & Seland, 2012), and the dropout rate in upper secondary schools in Norway is 20–30% (Statistics Norway, 2013). Adolescents' mental health problems, including loneliness, represent public health challenges that may affect social participation, future education and occupation, income and productivity, (Nes & Clench-Aas, 2011; National Institute for Public Health, 2014; WHO, 2014).

Correspondingly, the World Health Organization's report on adolescents' health, calls for approaches that look beyond the individual to improve the mental health of young people worldwide (WHO, 2014). A recent report on mental health promotion in schools in Norway has an increased focus on students' mental health (Holen & Waagene, 2014), both in identifying students who struggle and in the need for preventing mental health problems through focusing on enabling good psychosocial environments within schools. However, the report concludes that there is still a way to go before mental health promotion is a part of the systematic psychosocial work within schools, such as integration into activity plans and school policy documents (Holen & Waagene, 2014).

The psychosocial school environment is primarily concerned with interpersonal conditions, and how these affect the students' experiences of belonging, mental health, well-being, and thus learning in the broadest sense. The emphasis on psychosocial school

environment and teacher–student and peer relationships as important components in achieving mental health and well-being is not new. It was highlighted in Rutter, Maughan, Mortimore, Ouston, and Smith's (1979) seminal work nearly 40 years ago and still has resonance today. Rutter et al. (1979) stated that adolescents spend nearly half of their waking hours in school, and their well-being and social integration is influenced by the quality of their relationships with teachers and peers. More recent research, both nationally and internationally, shows that good psychosocial school environments promote health, well-being and positive social development, and prevent students from dropping out of school (Danielsen, Samdal, Hetland & Wold, 2009; Larsen et al., 2014; Lerner, von Eye, Lerner & Lewin-Bizan, 2009; Samdal & Rowling, 2011; 2015; Weare & Nind, 2011). For example, Krane, Karlsson, Ness and Kim's (2016) literature review highlighted the relationship between teachers and students as one of the most important factors for good mental health in students. Settertobulte and Matos (2004) and Birkeland, Breivik and Wold (2014) found that being liked and accepted by their peers was essential for young people's positive development, while loneliness was seen as a risk factor for dropping out (Frostad, Pijl, & Mjaavatn, 2014; Ramsdal, Gjærum, & Wynn, 2013). Also, studies points to that connection to peers and teachers has a profound influence on students' overall satisfaction with their school environment (Danielsen et al., 2009; Lerner et al., 2009; Tian, Zhao, & Huebner, 2015). Those who are not socially included are thus more likely to experience loneliness and difficulties in relation to their mental health.

As such, the Self-determination theory (SDT) highlights the mechanisms between the psychosocial environment, academic performance and mental health as social, contextual assets that facilitate processes of motivation, positive development and well-being (Ryan & Deci, 2000). SDT emphasizes three basic psychological needs—competence, autonomy and relatedness/belonging. When these needs are satisfied, they lead to enhanced motivation and

positive mental health (Ryan & Deci, 2000). In a school context, motivation, learning and well-being will be highest where the environment and culture support students emotionally and provide opportunities to experience belonging, autonomy and competence (Niemiec & Ryan, 2009; Tian, Chen, & Huebner, 2014; Zimmer-Gembeck, Chipuer, Hanisch, Creed & McGregor, 2006). In line with previous research on SDT in school settings (Kiefer, Alley, & Ellerbrock, 2015; Tian, Liu, Huang & Huebner, 2013; Tian, et al, 2014) and in regard to school belonging (Allen, & Kern, 2017; Allen, Kern, Vella-Brodrick, Hattie, & Waters, 2016), the mechanisms for change are that working with creating a good psychosocial environment that fulfils the students' need for belonging, competence and autonomy, leads to better mental health and reduced loneliness.

The current study

Thus, the school is a central institution in the life of students, and important for creating good conditions for positive development, promoting feelings of belonging, good mental health and well-being. Nevertheless, it is rare that the psychosocial environment is highlighted as a key target area in the individual school (Samdal & Rowling, 2011; 2015). The current study aims at examining the effect of a psychosocial school intervention on mental health problems, measured as anxiety and depressive symptoms, and loneliness among upper secondary school students in Norway. The study is a randomized controlled trial comparing single-tier- (only a universal program addressing all students) and multitier (the combination of both a universal and a selective and indicative tier) intervention schools to control schools. Both the single – and multitier tier build on SDT and provide tools for working systematically with the psychosocial environment to facilitate good integration into the school throughout the year.

In the current study, the main hypothesis is that adolescents attending intervention schools with either the single tier or the multi-tier measure will experience a decrease both in

mental health problems and loneliness compared to adolescents in the control schools. Both universal and indicative measures are supported in the literature (Durlak, Weissberg, Dymnicki, Taylor & Schellinger, 2011; Payton et al., 2008), and an underlying research question will be to see if they have differential effects.

Previous research has shown gender differences in self-reporting mental health problems and social support (Bakken, 2017; Derdikman-Eiron et al., 2012), with girls reporting increasing mental health problems and increased social support compared to same age boys. Although, efforts to improve the psychosocial environment aim at influencing both genders, it is found that girls more easily than boys benefit from the social relations and support that exist in the environment (Derdikman-Eiron et al., 2012). In regards to SES, research has found that higher SES groups report less mental health problems (Bakken, 2017; Skogen, Smith, Aarø, Siqveland, & Øverland, 2018). Thus, the second aim is to explore if there are differential effects in regards to gender and socioeconomic status.

Methods

Study design

The COMPLETE project is a school-based randomized controlled study in 17 upper secondary schools in four counties in Norway. The trial started in August 2016 and will end in June 2019. The study is non-blinded, and the design includes two intervention groups (a single-tier (I1) and a multi-tier intervention (I2)) and a control group. Details about the full trial can be found in the study protocol (Larsen, Urke, Holsen, Anvik, Olsen, Waldahl, Antonsen, Johnson, Tobro, Brastad & Hansen,2018). The present paper will assess the effect after 8 months of intervention.

Schools were self-selected, and eligible for participation if they had not previously or currently implemented any of the interventions, or similar interventions. Eligible schools

were assigned to one of three comparison groups by random allocation, 6 in the single-tier group (n = 1019), 6 in the multi-tier group (n = 1264), and 5 in the control groups (n = 720). The multitier group combined a universal program (the Dream School Program (DSP)) with a selective and indicative measure (the Mental Health Support Team (MHST)), while the single-tier group included only the universal program (DSP). The initial sample was n = 3003 students (Figure 1).

[Insert Figure 1 here]

The school context in Norway

In Norway, education is mandatory for all children aged 6–16 years. Since 1994, every student in Norway has been granted three years of upper secondary public schooling and can choose between vocational education programs and programs from general studies. Thus, almost all students attend upper secondary schools (ages 15-16, 16-17, and 18-19 years in first, second and third year respectively). In Norwegian upper secondary schools, approximately 25 students enroll in each class, with several classes in each year level. The students in the first grade stay together in the same class and the same room most of the day, while the teachers move between the classrooms. One or two teachers are assigned as contact teacher(s) and have special responsibility for the class. In addition, each school has student services that seek to address the students' social, emotional and academic challenges, as well as supporting them in exploring future careers. The student services vary somewhat from school to school, but the functions that are constant throughout are, first and foremost, counsellors, pedagogical psychological services (PPS)[2] and school nurses. Furthermore, there

[2] PPS is an external services helping students in need of special arrangements so that they receive an inclusive, equivalent and adapted educational offer. PPS works both individually and systematically.

is a follow-up service in all counties that is responsible for supporting youth under the age of 21 who have the right to training but are not employed or in training (The Education Act, 1998, §3-6).

Interventions

The Dream School Program (DSP)

The DSP was developed by the Norwegian NGO *Adults for Children* (AfC, 2017). The program is a universal and whole-school program, involving school staff and students, with the aim of creating environments where students are encouraged to participate, feel confident and experience a sense of belonging, and where mental health is promoted. A key element of the DSP is the training and use of peer leaders from second or third grade, called peer mentors, as important contributors to the program. The DSP contains specific core elements that must be conducted for it to be well implemented. These are the Dream Class 1 and 2, and the Dream Class poster, which provides guidelines for enabling a good psychosocial class environment. The Dream Class 1 is scheduled to the first week of school, and the Dream Class 2 is scheduled to the beginning of the second semester of the school year (January/February). The Dream Class poster should be developed during the first weeks of the first semester. A DSP manual for carrying out the program is provided to the responsible staff involved, in addition to training by AfC of school staff and peer mentors. The peer mentors are to be actively involved in collaboration with class teachers in carrying out these core elements. In addition, they welcome new students on the first day of school, convey information about class and school gatherings, and are intended to be actively involved in creating meeting points for socialization throughout the school year. They should also give special attention to students who seem to be left out or lonely. The effectiveness of the DSP has previously been evaluated in two pilot studies, with promising effects on academic self-

efficacy, teacher support and intention to continue upper secondary school the following year (Holsen, Larsen, Tjomsland & Sevan, 2015; Holsen, Larsen & Årdal, 2016).

The Mental Health Support Team (MHST)

The MHST is a team model developed in a collaboration between employees at Bodin Upper Secondary School in Norway (COMPLETE, 2018) and researchers at Nordland Research Institute (2017). The MHST team has its starting point in the school's student services and thus represents a reorganizing of existing resources within the school to work more systematic with identifying and follow up of students at risk. Each team consists of counsellors, school nurses and follow-up services staff. The MHST works both indicative and selective—it targets specific students with known mental health problems or other issues who are at risk of dropping out, and identifies and follows up on students who have patterns of high absence from school. It systematizes and reorganizes student services through: 1) services and staff working in services being situated at the same place; 2) having "one open door" to increase the accessibility of services and staff to students and teachers; 3) focusing on enhancing the quality of the school start to better facilitate the move from lower to upper secondary school, while also collaborating with lower secondary schools; 4) mapping all 1st year students' health and well-being during the autumn and follow-up talks with students with scores indicating that they are struggling. The score is based on Kidscreen; 5) having close follow-up of at-risk students to ensure tailored help is available to each student; and 6) focusing on early detection of absentee as well as intervention and follow-up when the student shows signs of absenteeism.

The teams are cross- and multidisciplinary, and facilitate collaborations within the MHST, between MHST and school leadership, and between lower and upper secondary schools. They also support teachers and act as supervisors in their work with at-risk students.

The control group

The effect of the intervention (both single-tier and the multi-tier) were measured against the control group which consisted of five randomly assigned upper secondary schools comprising a total sample of 541 students responding to the baseline assessment (see Figure 1 and Table 1 for details).

Data collection and measures

A baseline survey among all first year students was conducted electronically during school hours in August 2016, and the first follow-up survey was conducted in March/April 2017. Prior to data collection, written and verbal information was given to all students, emphasizing that participation was voluntary, ensuring anonymity and confidential use of data, and advising of the possibilities of withdrawal. Active parental consent was required from students under the age of 16 years at the time of data collection, and information was provided to all parents of these students in written and electronic form through the school or county e-mail and mobile text message (SMS) infrastructure. Because this study targets adolescents, only students who use their statutory right to attend upper secondary education and training (young person's right [3]) were included (The Education Act, 1998, § 3-1). For further details, see Larsen et al. (2018). The data collection was administered by trained researchers present at each school, to avoid strain on the schools and the teachers. The

[3] In accordance to The Education Act, young people who have completed primary and lower secondary education or the equivalent have, on application, the right to three years' full-time upper secondary education and training in Norway. This right is valid until the school year starting when the person concerned turn 24 years of age.

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measures included in the survey are all validated measures showing good psychometric properties in other studies in the Norwegian context of youth.

Measures

Mental health problems were measured by joint symptoms of anxiety and depression assessed with the short form of the Symptom Check List (SCL-5) (Tambs & Moum, 1993), a five-item instrument measured on a Likert scale with four response alternatives: *not bothered at all, a little bit bothered, quite much bothered* and *very much bothered.* Internal consistency was excellent with Cronbach's $\alpha = .90$. The scale items were summarized into a sum score, and treated as a continuous variable in further analyses.

Loneliness was assessed with the Loneliness scale (adapted for Norway by Mittelmark, Aarø, Henriksen, Siqveland & Torsheim, 2004), a six-item instrument measured on a Likert scale with five response alternatives: *very much, quite a bit, somewhat, only a little* and *not at all*. Internal consistency was good with Cronbach's $\alpha = .79$. The scale items were summarized into a sum score, and treated as a continuous variable in further analyses.

Perceived Family Wealth (PFW) was used as a proxy for family socioeconomic status. PFW is a single item asking for the subjective perception of family socioeconomic standing through the question: *"How well-off is your family?"* with response categories *very well-off, well-off, somewhat well-off, not well-off* and *poorly off*. This item has been used widely in the Health Behaviour in School-Aged Children-study in previous studies of SES in relation to adolescent health and behavior outcomes (Bujis et al., 2016; Currie et al., 2010; Moor et al., 2015; Pfortner, Gunter, Levin, Torsheim & Richter, 2014; Zaborskis, Sumskas, Maser & Pudule, 2006;).

Information on gender (boy/girl) and education program (academic/vocational) was obtained from registry data provided by the counties in which the project schools belong.

Information on ethnicity was collected through self-report on the question "*Where were you born?"*, with the option of ticking off a country on a drop-down list of all world countries.

Randomisation

Random allocation of schools into comparison groups was done by researchers without prior knowledge of the recruited schools. The allocation was done through a computer generated randomization list. Stratified randomization by county was practiced to ensure equal representation of intervention and control groups across counties. More details on the randomization procedure is found in Larsen et al. (2018).

Statistical analyses

Data were analyzed using Stata version 15.0 (www.stata.com). Sum scores were calculated for the SCL-5 and Loneliness measures. The sum scores were then divided by the number of items. Evaluation of effect was conducted according to the intention-to-treat principle, and adjusted for the clustered nature of the data using a four-level restricted linear mixed model, including random and fixed effects. The random effects are included to account for clustering within school, within class and within individual across time. Alpha levels were set at $p \leq .05$. Data were examined for systematic differences in attrition based on gender, PFW, school specialization, and outcome variables (loneliness and mental health problems). No statistically significant differences in gender or PFW were identified. A small statistically significant difference was found for school specialization, loneliness, and mental health problems. This difference might be due to students with mental health issues avoiding the survey, or because these students had already quit school before follow-up. Missing data were not imputed, but handled with full information maximum likelihood estimation in regression analyses.

Ethical approval

The COMPLETE study was registered and approved by the Norwegian Centre for Research Data. The study was also registered in the Clinical.Trials.gov register (registration number NCT03382080). For further details, see Larsen et al. (2018).

Results

Participants

The baseline characteristics showed an even distribution of gender, PFW and ethnicity across all three groups (interventions and control) (Table 1). There were between 43% and 50% girls in the groups, 64–68% reported being in the upper middle PFW category and 87–93% were ethnic Norwegian. There was a slightly less even distribution of school programs in the groups, with only 38% of the single-tier group (I1, who received DSP only) attending vocational education compared with 60% of the multitier group (I2, who received DSP and MHST) and 63% in the control group. The mean age at baseline was 16.82 years. A total of 2254 students provided survey data at baseline and 2326 at T1. 1937 (85%) students participated at both baseline and T1. The missing in T1 is assumed to be at random. Though we do not know exactly why students did not attend, the impression from the data collection is that the reasons are largely unrelated to the outcomes, e.g. sick leave, dentist appointments, and a few classes were absent due to field trips or practice work.

[Insert Table 1 here]

Intervention effects

The intra class correlation coefficient (ICC) was 1%, for the school level, and thus small for the school level, larger for the class level (7–9%), and largest for the individual level (64–67%).

The mean outcomes for both mental health problems and for loneliness increased from baseline to follow-up (T1). An increase in the score is interpreted as the student getting lonelier and experiencing increased mental health problems. Mental health problems increased by 0.08 for the control group, 0.11 for I1 and 0.06 for I2. Loneliness increased by 0.08 in the control group, by 0.7 in I1, and by 0.01 in I2.

The intervention effect is determined by the time treatment interaction listed under fixed effects in Table 2.

[Insert Table 2 here]

The interaction coefficient shows the relative development in outcomes for the intervention groups compared with the reference (control) group. The intervention effect for mental health problems was −0.01 (CI: −0.09, 0.07) for I1 and −0.04 (CI: −0.12, 0.03) for I2, neither being significant. The intervention effect for loneliness was −0.01 (CI: −0.08, 0.09) for I1 and -0.08 (CI: -0.15, 0.00) and not significant. The intervention effects are displayed in Figure 2.

[Insert Figure 2 here]

Subgroup analysis

There were differences between genders in both the levels of mental health problems and loneliness at baseline. Girls had a mean level for mental health problems of 2.05 (SD: 0.82) and boys had a mean level of 1.54 (SD: 0.69), with both experiencing an increase in mental health problems at T1. Concerning loneliness, girls reported higher levels of loneliness at baseline with a mean of 2.34 (SD: 0.81) compared with boys who had a mean of 2.16 (SD: 0.75). Only girls reported an increase in mean levels of loneliness at T1.

Using a three-way interaction between gender, time and treatment, we found that the intervention effect for girls in I2 for mental health problems was significant with an effect of −0.17 (CI: −0.32, −0.01) (p = .033). The loneliness outcome was not significant at subgroup level (gender). All intervention effects by gender are displayed in Figure 3. The three-way interaction between SES subgroups, time and treatment was not significant.

[Insert Figure 3 here]

Discussion

Previous research has found that the period around starting upper secondary schooling can be demanding (Eccles & Roeser, 2009; 2011) in terms of mental and psychosocial health (Bakken 2017; 2018). The purpose of the interventions evaluated in this study is to buffer the often observed increase in loneliness and mental health problems over this period. However, in this study, the overall mean level of mental health problems and loneliness increased for the two intervention groups as well as for the control group from baseline to follow-up. Furthermore, the results showed no effect of the intervention on mental health problems and loneliness on students in either of the intervention groups. The results indicated only a minor effect of the intervention on mental health problems for girls in I2. There were no significant differences between SES subgroups. There could be several reasons for the increase in mental health problems and loneliness as well as not finding significant effects of the intervention.

The shift from lower secondary- to upper secondary school is associated with risk, and requires the facilitation of a good and secure start-up and integration processes in the new school (Eccles & Roeser, 2009; 2011). Our results support the notion of a challenging period when starting up in upper secondary high school as we found an increase in both outcome measures in all three groups. This is an important finding in itself, as these can lead to negative youth development and need to be prevented.

Previous research have showed gender differences in prevalence of mental health problems (Bakken, 2017; Bakken 2018; Stoltenberg, 2015). Although the effect are very small, results showed some effect on girls in the multi-tier group, as they had a less negative development on mental health problems compared to girls in the single-tier and control group. As girls in general reports higher levels of mental health problems (Bakken, 2017; Bakken 2018; Stoltenberg, 2015) the findings in this study are somewhat promising. One explanation can be that in general, when girls experience emotional distress, they are more likely to seek support and express their feelings than boys. Therefore, they may get more support, which may contribute to a positive emotional modification (Rose & Rudolph, 2006) and reduced experience of mental health problems (Derdikman-Eiron et al., 2012). As the intervention did not have any mitigating effect on boys in this study, one could question whether there is a need for more attention to gender differences in interventions like this one. Bakken (2018) found a negative trend in the last two youth surveys in Norway with an increase in reported mental health problems also among boys. A finding underscoring the need for researchers to take into consideration gender when designing mental health promoting intervention in future.

The lack of effects might also be related to the timeframe. It takes time to establish a systematic focus on mental health promotion and improve the psychosocial environment in schools (Durlak & Dupre, 2008). Studies show that the psychosocial environment traditionally has had little focus both nationally and internationally (Holen & Waagene, 2014; Samdal & Rowling, 2011; 2015), even if it is considered an important tool for mental health promotion and the prevention of dropout in school (Lillejord et al., 2015). Within this project, the timeframe might have been too tight, as the schools only had three or four months between deciding to participate in the study and the intervention starting. During this time, the school had to train teachers and peer mentors, and put the Dream School resource group

in place. Those within the multi-tier group also had to establish the MHST, develop new routines for student follow-up, relocate to a team office, and clarify roles and responsibilities within the school. In line with other research, readiness for implementation might have been jeopardized, which consequently influenced the effects (Durlak & DuPre, 2008; Oterkiil & Ertesvåg, 2012). However, as we did find some mitigating effects for girls, one could anticipate that with more time for planning and preparation, there might be stronger effects in the future. A final point to be made is the fact that we only found mitigating effects for girls in the multitier group suggests that well-targeted efforts toward individual learners, together with a universal approach might have more impact on reducing further negative development. This should however be interpreted with caution due to very small effects.

Strengths and limitations

The randomized controlled trial design with a large number of participants, and the relatively long follow-up period of 8–9 months, are considered strengths in this study. Although the lack of statistical power due to the low number of participating schools is a weakness. The self-selection of schools to the study may also have influenced the generalizability, as the schools included may have been more open to enhancing the school environment. However, results suggest that schools varied a lot in their readiness to implement, and thus may be representative of other schools. As described earlier, attrition from baseline to first follow-up could be due to more mental health problems. However, the probit analyses to examine missing patterns indicated a very small significant difference. Also, attrition could be due to unobserved aspects not taken into account in this study, such as prevalence of absence or drop-out. Further, using only a self-reported item of PFW is limited for capturing the complex dimensions of SES. Although this item has been found to measure SES in relation to health and health behaviors in previous studies (Bujis et al., 2016; Currie et

al., 2010; Moor et al., 2015; Pfortner et al., 2014; Zaborskis et al., 2006), additional measurements would have to be included used to capture different aspects of SES.

Conclusion

The intervention had an small mitigating effect in the multitier group on mental health in girls, suggesting that the combination of a universal approach and more targeted effort for those in need may be most beneficial. The fact that everyone had an increase in mental health problems and loneliness also found in previous studies (Bakken 2017; 2018) suggests that there is a need for schools to work systematically to create positive and supportive environments for their students, to mitigate the challenges of moving from one school level to the next.

Acknowledgments

We sincerely thank all the participants for their efforts in planning and carrying out the interventions, and for complying with the survey and interviews. We would also like to thank the Ministry of Education and Integration for funding (project grant number 20161789).

Disclosure statement

There are no potential conflicts of interest.

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