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## Depression in childhood and adolescence – development and piloting of a psychoeducational program for the professional development of teachers

*Friederike C. Grabowski*

Europa-Universität Flensburg

### Abstract

The prevalence of depression in adolescence is increasing, which has adverse and long-lasting effects. Even though teachers can facilitate early recognition and help for affected individuals, appropriate training is needed. The training program, *glücklich*, was developed and piloted in one formative and two summative studies. It aims to improve depression literacy, action knowledge, and the subjective competence to act of teachers. *Glücklich* was evaluated online with teacher training students ( $n = 84$ ) and teachers ( $n = 7$ ). In both summative studies, the program was evaluated in a pre-post-follow-up design. In study 1 ( $n_1 = 8$ ), teacher training students answered a formative questionnaire after the training. This revealed that some improvement was required. In studies 2 and 3,  $n = 91$  ( $n_2 = 78$ ;  $n_3 = 13$ ) teacher training students and teachers answered the questionnaires (baseline sample:  $n_2 = 113$ ;  $n_3 = 32$ ). A significant increase in depression literacy (study 2:  $\eta^2 = 0.512$ ; study 3:  $\eta^2 = 0.664$ ) and action competence (study 2:  $\eta^2 = 0.229 / \eta^2 = 0.353$ ; study 3:  $\eta^2 = 0.597 / \eta^2 = 0.609$ ) was observed in the posttest and maintained in the follow-up. Participants showed significant improvements regarding their subjective competence to act (study 2:  $\eta^2 = 0.44$ – $0.66$ ; study 3:  $\eta^2 = 0.50$ – $0.80$ ). These improvements could be maintained at follow-up. The piloting of *glücklich* shows promising preliminary results for the improvement of early recognition of depressed students and the ability of teachers to help. In a following control-design study, these results should be reinforced with a sample of qualified teachers in a face-to-face setting.

*Keywords:* adolescent, depression, depression literacy, teacher, training, prevention

### Depressionen im Kindes- und Jugendalter - Entwicklung und Pilotierung einer psychoedukativen Fortbildung für Lehrkräfte

#### Zusammenfassung

Die Prävalenz von Depressionen im Jugendalter nimmt zu, welches nachteilige und lang anhaltende Auswirkungen hat. Auch wenn Lehrkräfte bei der Früherkennung und Hilfe für Betroffene helfen können, fehlt es an geeigneten Fortbildungen. Das Trainingsprogramm

glücklich wurde daher entwickelt und in einer formativen und zwei summativen Studien pilotiert. Es zielt darauf ab, die Depressionskompetenz, das Handlungswissen und die subjektive Handlungskompetenz von Lehrkräften zu verbessern. **Glücklich** wurde online mit Lehramtsstudenten ( $n = 84$ ) und Lehrkräften ( $n = 7$ ) evaluiert. In beiden summativen Studien wurde das Programm in einem Prä-Post-Follow-up-Design untersucht. In Studie 1 ( $n_1 = 8$ ) beantworteten Lehramtsstudierende nach der Fortbildung einen formativen Fragebogen. Dieser ergab, dass einige Verbesserungen erforderlich waren. In Studien 2 und 3 beantworteten  $n = 91$  ( $n_2 = 78; n_3 = 13$ ) Lehramtsstudierende und Lehrkräfte die Fragebögen (Ausgangsstichprobe:  $n_2 = 113; n_3 = 32$ ). Ein signifikanter Anstieg der Depressionskompetenz (Studie 2:  $\eta^2 = 0.512$ ; Studie 3:  $\eta^2 = 0.664$ ) und der Handlungskompetenz (Studie 2:  $\eta^2 = 0.229 / \eta^2 = 0.353$ ; Studie 3:  $\eta^2 = 0.597 / \eta^2 = 0.609$ ) wurde im Posttest beobachtet und im Follow-up beibehalten. Die Teilnehmenden zeigten signifikante Verbesserungen hinsichtlich ihrer subjektiven Handlungskompetenz (Studie 2:  $\eta^2 = 0.44$ – $0.66$ ; Studie 3:  $\eta^2 = 0.50$ – $0.80$ ). Diese Verbesserungen konnten im Follow-Up beibehalten werden. Die Pilotierung von **glücklich** zeigt vielversprechende vorläufige Ergebnisse für die Verbesserung der Früherkennung von depressiven Schülerinnen und Schülern und der Fähigkeit von Lehrkräften, diesen zu helfen. In einer anschließenden Studie mit Kontrolldesign sollen diese Ergebnisse in einer Präsenzfortbildung bestätigt werden.

Schlüsselwörter: Jugendliche, Depression, Depressionskompetenz, Lehrkräfte, Fortbildung, Prävention

Depressive disorders are among the most common mental illnesses in childhood and adolescence across the world (Costello et al., 2006), with a prevalence of around 5–10% in Germany (Groen & Petermann, 2013; Ravens-Sieberer et al., 2007; Schulte-Körne, 2018; Wartberg et al., 2018). Early-onset depression is often persistent and can continue into adulthood (Klasen et al., 2017). Moreover, depression in this age group leads to the most protracted impairments in life, including a significantly increased risk of suicide, which is the second leading cause of death among adolescents (Petermann & Vries, 2016). Depression is also associated with a considerable risk of comorbid psychological disorders, somatic concomitant symptoms, and chronification. Consequently, depressive children and adolescents suffer from problems at school, in the family, and in wider social environments (Essau, 2007; Gander & Buchheim, 2013), necessitating a greater focus on the prevention and early detection of this disorder. The Coronavirus Disease

2019 (COVID-19) pandemic has added to the psychological burden affecting children and adolescents, exacerbating the problem of mental disorders among them (Ravens-Sieberer et al., 2021). Depressive symptoms such as irritability, social withdrawal, and cognitive decline could be observed by teachers (Puura et al., 1998) but are often dismissed as development-specific behavior, such as moodiness or laziness (Ahnert et al., 2016; Crundwell & Killu, 2010). If teachers are educated adequately, they can play an essential role in identifying affected students and taking appropriate steps to facilitate their treatment by mental health professionals (Moor et al., 2007). At present, however, most students with depressive symptoms remain undetected by their teachers (Auger, 2004; Gander & Buchheim, 2013) and untreated for their disorder (Klasen et al., 2017; Ravens-Sieberer et al., 2007; Wittchen et al., 2010). Despite their essential role in the early detection and referral of depressive students, teachers rarely receive the necessary training and support

to enable them to do this effectively. Initial depression-specific model projects for teachers in Germany (e.g., Ahnert et al., 2016) and internationally (e.g., Martínez et al., 2015; Moor et al., 2007) show some promising results. However, they are struggling with high dropout rates (Ahnert et al., 2016), difficulties in improving the ability of teachers to recognize depressed students (Moor et al., 2007), or focus only on improving knowledge about depression (Martínez et al., 2015). A recent meta-analysis by Yamaguchi et al. (2020) reviewing 16 studies on mental health literacy programs for teachers found that while most studies claimed significant improvements in knowledge, attitudes, behavior, and confidence among teachers, the results were inconsistent and of relatively low outcome quality. According to the Grades of Recommendation, Assessment, Development, and Evaluation (GRADE) Framework (Schünemann et al., 2013), the overall quality of the evidence was rated as very low. All but one of the included studies had a high or unclear risk of bias due to lack of allocation concealment, lack of control for confounding factors, and/or inadequate dropout analysis.

This paper presents the development and piloting of *glücklich*, a time-economic training program for the professional development of teachers regarding depression in childhood and adolescence. It will be further evaluated to provide it in the future as a standardized program for teachers. The program was formatively (study 1) and summatively (studies 2 and 3) evaluated, with  $N = 99$  ( $n_1 = 8$ ,  $n_2 = 78$ ,  $n_3 = 13$ ) teacher training students (93 %) and qualified teachers (7 %) participating.

## Method

A 2-hour program for the professional development of teachers on depression and suicide in childhood and adolescence (*glücklich*) was developed and formatively evaluated with  $n_1 = 8$  teacher training stu-

dents. Subsequently, the teacher training was piloted with two samples ( $n_2 = 78$ ,  $n_3 = 13$ ) in a pre-post-follow-up design with three measurement points (before training [T1]; after training [T2]; 1-month follow-up [T3]).

## Development of the teacher training

For the development of the program, relevant publications (Becker & Keitel, 2013; Castello, 2017; Castello & Brodersen, 2020; Gander & Buchheim, 2013; Groen & Petermann, 2011b; James et al., 2018; Weinhardt & Kansteiner, 2005), and existing training programs/presentations (Ahnert et al., 2016; El Khatib, 2015; Moor et al., 2007; Schiller, 2011) on depression and suicide in childhood and adolescence were reviewed and integrated into an overall concept.

Due to the limited time available, *glücklich* focuses on conveying basic knowledge, action strategies, and contact options regarding depression and suicide in childhood and adolescence (table 1). For this purpose, the training is divided into two parts. After a brief introduction with basic facts about symptoms, forms, and prevalence of depressive disorders, the first unit's focus is on the occurrence of depressive symptoms at school and depressive alarm signals for teachers. Additionally, the differentiation between pubertal and depressive symptoms as well as do's and don'ts for teachers are discussed. In the second unit, a transition is created between depression and suicide, with alarm signs of suicidal behavior in school and teachers' appropriate behaviors. Both units conclude with a listing of contact resources (regional, online, and by telephone). The program ends with further literature recommendations on the topic (Bründel, 2004; Castello, 2017; Castello & Brodersen, 2020; Döpfner, 2000; Essau, 2007; Groen & Petermann, 2011a; Nevermann & Reicher, 2020; Riecke-Niklewski & Niklewski, 2016).

Table 1: Overview content, didactics, and duration of the program

Content	Didactics	Duration
Importance of the topic	Presentation, interim conclusion & questions	10 minutes
Symptoms of depression	Presentation, interim conclusion and questions, discussion of case vignette	15 minutes
Depression in school	Presentation, interim conclusion and questions	15 minutes
Forms of depression, comorbidities, implications (short and long-term)	Presentation, interim conclusion and questions, discussion of case vignette	10 minutes
Development of depression (risk and protective factors)	Presentation, interim conclusion and questions	15 minutes
Strategies for teachers – depression (alarm signals, do's and don'ts, contact options)	Presentation	20 minutes
Relation between depression and suicidal behavior	Presentation, interim conclusion and questions, discussion of case vignette	10 minutes
Risk groups and risk factors for suicidal behavior	Presentation, interim conclusion and questions	10 minutes
Strategies for teachers – suicidal behavior (alarm signals, do's and don'ts, contact options)	Presentation, interim conclusion and questions	20 minutes
Presentation of further literature	Presentation	5 minutes

The program was planned to be conducted in a face-to-face setting. However, due to COVID-19, it was adapted as an online format and conducted online by the author. In the formative study, *glücklich* was prerecorded and uploaded. In the two summative studies, the training was conducted live online. Therefore, participants in studies 2 and 3 were actively involved by discussing case vignettes describing depressed and, in some cases, suicidal students. Additionally, after every subtopic, interim conclusions were drawn, and questions on the subtopic were answered and discussed.

*Glücklich* is an innovative program because it explicitly addresses depression in childhood and adolescence rather than the broader topic of mental health, as other programs for teachers do (Eustache et al., 2017; Kutcher et al., 2015; Powers et al., 2014). Moreover, the time-efficient concept and the fact that it is conducted on one date prevents dropouts, which has been a problem in other training courses (Ahnert et al., 2016). This program can be distinguished from other programs because a parallel psy-

choeducational program for students on the topic of depression was developed, making *glücklich* a comprehensive program for the entire school.

### The selection of subjects

The formative evaluation (study 1) was conducted with teacher training students at a university in northern Germany. A request for participation was sent to all teacher training students enrolled in a Master's course regarding clinical child and adolescent psychology. For the first summative study (study 2), the program was conducted as part of a module on clinical child and adolescent psychology in the Master's program of special education teaching students. All module participants ( $N = 115$ ) attended the program and were asked to participate in the evaluation, which  $n_2 = 78$  did at all three measurement points. The second summative study's program for the professional development of teachers (study 3) was offered in cooperation with a teacher training center. *Glücklich* was part of the semester pro-

gram offered by the teacher training center and advertised through it. Teacher training students and qualified teachers in Northern Germany could participate. The program on depression was fully booked with  $N = 32$  attending, of which  $n_3 = 13$  participated in the evaluation.

## Questionnaires and measurement points

### Study 1

The formative evaluation questionnaire was explicitly developed for this purpose. It constitutes of 39 open-answer questions regarding comprehensibility, missing content, didactic preparation, examples, illustration, slide presentation, and the lecture's fit with the content. It could be filled out online using SoSci Survey (Leiner, 2020) and was available for six weeks.

### Study 2 and 3

A questionnaire for teachers was developed because no appropriate standardized measure on *depression literacy*, *action knowledge*, and *subjective action competence* exists (Yamaguchi et al., 2020). The questionnaire's *depression literacy* section consists of 24 items regarding depression and suicide in childhood and adolescence and can be answered on a two-level scale (true/not true). The *action competence* section collects data by depicting two case vignettes, describing one student with depressive symptoms and a second with depressive and suicidal symptoms. After reading the case vignette, 11 (case vignette with depressed student) or 12 (case vignette with depressed and suicidal student) possible actions can be rated. In study 2, possible actions could be rated on a four-level scale (necessary/helpful/harmful/do not know). After the participants' feedback on the problematic distinction between the options "necessary" and "helpful", it was decided to change the answer format to only consisting

of three options (helpful/not helpful/do not know) in study 3. The section on *subjective competence to act* consisted of five questions in the second study. It was cut down to four questions in the third study because one item provided psychometrically problematic results (results indicated that participants did not understand the question right and did not provide added value for the evaluation). The items can be answered on a four-level scale (agree/partially agree/partially do not agree/do not agree). The questionnaire was sent to participants three times (T1: before the training, T2: directly after the training, T3: 1 month after the training) and could be filled out online using SoSci Survey (Leiner, 2020, 2021). At T1, demographic information was collected. Satisfaction with the training and suggestions for improvement were collected in an open-answer format at T2.

The author developed the questionnaire based on existing instruments (Ahnert et al., 2016; Freitag et al., 2018; O'Connor & Casey, 2015). When no items were available for specific variables, they were constructed. The questionnaire was not evaluated individually but together with the training program.

## Analysis

### Study 1

Because the questionnaire regarded the formative evaluation of the training, it was only evaluated descriptively.

### Study 2 and 3

In the *depression literacy* and *action knowledge* part of the questionnaire, all correct answers were awarded one point and added separately. Changes in the scale values over the three measurement points of *depression literacy* and *action knowledge* were tested for using Cochran's Q. Concerning the *subjective competence to act*, the analysis was carried out over all three

measurement points using repeated-measures analysis of variance. Furthermore, effect sizes (partial Eta-squared) were calculated. All quantitative analyses were performed using SPSS 27.0 (IBM Corp., 2020). The significance level was set at  $\alpha = 0.05$ . In case of multiple testing,  $\alpha$  was adjusted according to Bonferroni correction. Satisfaction with the training and suggestions for improvement were evaluated descriptively.

## Results

### Sample description

#### Study 1

The sample of study 1 includes  $n_1 = 8$  teacher training students (100% female). The participants' mean age is 24.12 years ( $SD = 1.13$ , Range = 22–25).

#### Study 2

In study 2, the total sample comprises  $n_2 = 78$  teacher training students (91% female, 9% male). The mean age is 24.41 ( $SD = 4.13$ , Range = 21–48).  $N = 37$  participants dropped out in the course of the study ( $n_{t2} = 6$  at T2,  $n_{t3} = 31$  at T3).

#### Study 3

$N_3 = 13$  (100% female) people participated in study 3 of whom  $n = 7$  are qualified teachers and  $n = 6$  are teacher training students. The participants are 33.08 years old on average ( $SD = 14.60$ , Range = 20–56).  $N = 19$  participants dropped out in between measurement points ( $n_{t2} = 2$  at T2,  $n_{t3} = 17$  at T3).

### Formative evaluation

For the most part, the teacher training was assessed positively regarding the surveyed areas (comprehensibility, missing content, didactic preparation, examples, illustra-

tion, slide presentation, lecture's fit with the content). A need for improvement was expressed regarding the design of some slides, the explanation of technical terms, and the training's tempo (too fast). All feedback was evaluated and incorporated into the teacher training before conducting study 2 and study 3.

### Effects of the training

#### Depression literacy

In the questionnaire's *depression literacy* section, the participating teachers' answers before implementing the program [T1] vary depending on the item ( $M = 0.23$ – $1.00$ ; Table 2). In study 2, there is a significant improvement in 15 of the 24 items regarding correct answers comparing the pretest [T1] to the posttest [T2]. Significant changes occur primarily for questions related to depressive symptoms (e.g., "Noticeable weight gain or loss may be a sign of depression"), processes of development (e.g., "Children of depressed parents have an increased risk of developing depression."), and the relationship between depression and suicide (e.g., "Depression is the strongest predictor of suicidal behavior"). In three items, improvement was impossible due to ceiling effects. No thematic connection can be determined for these items. In the follow-up evaluation [T3], most improvements from pre- to posttest can be maintained. Looking at the scale value *depression literacy* across all 24 items (sum of correct answers), an increase of correct answers can be seen from T1 ( $M = 18.97$ ,  $SD = 2.14$ ) to T2 ( $M = 21.71$ ,  $SD = 1.60$ ) and T3 ( $M = 21.41$ ,  $SD = 1.74$ ) on average. This change becomes significant ( $F[2, 80] = 1.02$ ,  $p = < 0.01$ ,  $\eta^2 = 0.512$ ).

Regarding study 3, a significant knowledge improvement can be found in five of the *depression literacy* items from pretest to posttest, for which no particular thematic cluster can be identified. Again, in nine items, no improvement was possible because of an already excellent score in the

pretest. These ceiling effects occur primarily for items regarding depressive symptoms (e.g., "As a result of depression, people may move more slowly or be restless."), and processes of development (e.g., "Children and adolescents with increased vulnerability are more likely to develop depression."). All of the improvements can be sustained in the follow-up evaluation. Analyzing the scale value *depression literacy*, from T1 ( $M = 19.38$ ,  $SD = 1.19$ ) to T2 ( $M = 22.00$ ,  $SD = 1.29$ ) and T3 ( $M = 21.92$ ,  $SD = 1.55$ ) a slight increase in correct answers occurs and becomes significant ( $F[2, 24] = 1.41$ ,  $p < 0.01$ ,  $\eta^2 = 0.664$ ).

### Action knowledge

In the *action knowledge* part of the questionnaire in the pretest, the answers' correctness varies depending on the item and case vignette ( $M = 0.00$ – $1.00$ ; Table 3). In study 2, a significant improvement of correct answers can be found in 5 of 11 items regarding case vignette 1 (cv1) depicting a depressed student. These significant changes are mainly found for items regarding conversations with the child or adolescent (e.g., "Promise confidentiality in conversation with the child/adolescent."). Concerning case vignette 2 (cv2), which portrays a depressed and suicidal student, in 7 of the 12 items, a significant improvement of correct responses from pretest [T1] to posttest [T2] can be seen and, for the most part, maintained in the follow-up evaluation [T3]. As in cv1, these changes mainly relate to conversation situations (e.g. "Talking with the child/adolescent about the purpose of suicide.") as well as interactions with external persons (e.g. "Approaching colleagues and consulting with them."). Regarding the scale value *action knowledge*, a slight increase from T1 (cv1:  $M = 5.36$ ,  $SD = 1.51$ ; cv2:  $M = 5.36$ ,  $SD = 1.68$ ) to T2 (cv1:  $M = 6.51$ ,  $SD = 1.57$ ; cv2:  $M = 6.96$ ,  $SD = 1.72$ ) can be observed and maintained in T3 (cv1:  $M = 6.31$ ,  $SD = 1.43$ ; cv2:  $M = 6.96$ ,  $SD = 1.66$ ). This change is significant for cv1 ( $F[2,$

$23] = 0.54$ ,  $p = < 0.01$ ,  $\eta^2 = 0.229$ ) as well as for cv2 ( $F[2, 42] = 0.74$ ,  $p = < 0.01$ ,  $\eta^2 = 0.353$ ).

Study 3 shows a significant improvement of correct responses for cv 1 (depressed student) in 4 of 11 items from pretest to posttest. These significant changes can primarily be found for items regarding talking with the child or adolescent (e.g. "Look for solutions during the conversation with the child/adolescent."). In cv 2 (depressed and suicidal student), 3 of 12 items show significant knowledge improvements from pretest to posttest and can be maintained in the follow-up. Again, the changes relate to items regarding conversation situations. For four items, improvement in the posttest was not possible due to ceiling effects. These items relate to actions within the class (e.g. "Isolate child/adolescent within the class.") and with external persons (e.g., "Consult the school psychology service."). Concerning the scale value *action knowledge*, from T1 (cv1:  $M = 7.31$ ,  $SD = 0.86$ ; cv2:  $M = 8.00$ ,  $SD = 1.08$ ) to T2 (cv1:  $M = 9.00$ ,  $SD = 1.16$ ; cv2:  $M = 10.15$ ,  $SD = 0.80$ ) and T3 (cv1:  $M = 8.77$ ,  $SD = 1.30$ ; cv2:  $M = 10.15$ ,  $SD = 1.46$ ) an increase can be found. This change proves to be significant in both case vignettes (cv1:  $F[2, 18] = 1.22$ ,  $p = < 0.01$ ,  $\eta^2 = 0.597$ ; cv2:  $F[2, 19] = 1.25$ ,  $p = < 0.01$ ,  $\eta^2 = 0.609$ ).

### Subjective competence to act

The subjectively perceived *competence to act* improves significantly in four of five items in study 2 from pretest to posttest (Table 4). These positive changes can be maintained in the follow-up evaluation. Effect sizes are large ( $\eta^2 = 0.44$ – $0.66$ ) for all items except one.

In study 3, all four items queried show a significant improvement from pretest to posttest (Table 4). Similar to study 2, these improvements can be kept up in the follow-up. Effect sizes prove to be large in all four items ( $\eta^2 = 0.50$ – $0.80$ ).

Table 2: Mean, standard deviation, and Cochran's Q of individual items regarding depression literacy from pretest to posttest to follow-up in study 2 and study 3 (n<sub>2</sub> = 78, n<sub>3</sub> = 13)

Item	n <sub>2</sub> /n <sub>3</sub>	Pretest	Posttest	Follow-Up	Exact signif. (Cochran's Q) <sup>2β</sup>
		M <sup>a</sup> (SD) <sup>2β</sup>	M <sup>a</sup> (SD) <sup>2β</sup>	M <sup>a</sup> (SD) <sup>2β</sup>	
1. School factors can be a trigger, but not a cause, of depression in children and adolescents.	78/	0.44 (0.50)/	0.85 (0.36)/	0.81 (0.40)/	< 0.01**/
	13	0.38 (0.51)	1.00 (0.00)	0.92 (0.28)	< 0.01**
2. Children of depressed parents have an increased risk of developing depression.	78/	0.94 (0.25)/	0.99 (0.11)/	1.00 (0.00)/	0.02*/
	13	1.00 (0.00)	1.00 (0.00)	1.00 (0.00)	n.p.
3. Children and adolescents with increased vulnerability (psychological fragility) are more likely to develop depression.	78/	0.94 (0.25)/	1.00 (0.00)/	1.00 (0.00)/	0.01**/
	13	1.00 (0.00)	0.92 (0.28)	1.00 (0.00)	0.37
4. Depressive and adolescent behaviors can be well distinguished from each other.	78/	0.86 (0.35)/	0.86 (0.35)/	0.88 (0.32)/	0.75/
	13	0.85 (0.38)	0.92 (0.28)	0.92 (0.28)	0.37
5. Too much or too little sleep can be a sign of depression.	78/	0.91 (0.29)/	1.00 (0.00)/	0.99 (0.11)/	< 0.01**/
	13	0.85 (0.38)	1.00 (0.00)	1.00 (0.00)	0.14
6. Noticeable weight gain or loss may be a sign of depression.	78/	0.90 (0.31)/	0.99 (0.11)/	1.00 (0.00)/	< 0.01**/
	13	0.92 (0.28)	1.00 (0.00)	1.00 (0.00)	0.37
7. As a result of depression, people may move more slowly or be restless.	78/	0.85 (0.36)/	0.99 (0.11)/	1.00 (0.00)/	< 0.01**/
	13	1.00 (0.00)	1.00 (0.00)	1.00 (0.00)	n.p.
8. Depression does not affect memory, attention, and concentration processes.	78/	0.92 (0.27)/	0.91 (0.29)/	1.00 (0.00)/	0.04*/
	13	1.00 (0.00)	0.85 (0.38)	0.77 (0.44)	0.17
9. Depression is part of puberty.	78/	0.96 (0.19)/	0.95 (0.22)/	0.95 (0.22)/	0.82/
	13	0.69 (0.48)	0.92 (0.28)	0.85 (0.38)	0.09
10. Children and adolescents who have depression often also have another mental illness.	78/	0.44 (0.50)/	0.81 (0.40)/	0.72 (0.45)/	< 0.01**/
	13	0.23 (0.44)	0.69 (0.48)	0.92 (0.28)	< 0.01**
11. From puberty onwards, more boys than girls are affected by depression.	78/	0.94 (0.25)/	0.82 (0.39)/	0.67 (0.47)/	< 0.01** <sup>b</sup> /
	13	0.92 (0.28)	0.85 (0.38)	0.62 (0.51)	0.04* <sup>b</sup>
12. Five percent of all teenagers develop depression.	78/	0.68 (0.47)/	0.86 (0.35)/	0.87 (0.34)/	< 0.01**/
	13	0.62 (0.51)	0.92 (0.28)	1.00 (0.00)	0.03*
13. Most of the time, depressed children and adolescents remain with one depressive episode.	78/	0.64 (0.48)/	0.65 (0.48)/	0.49 (0.50)/	0.01** <sup>b</sup> /
	13	0.69 (0.48)	0.46 (0.52)	0.38 (0.51)	0.07
14. Suicide is the second leading cause of death among adolescents.	78/	0.59 (0.50)/	0.90 (0.31)/	0.90 (0.31)/	< 0.01**/
	13	0.69 (0.48)	1.00 (0.00)	1.00 (0.00)	0.02*
15. Depression is the strongest predictor of suicidal behavior.	78/	0.79 (0.41)/	0.97 (0.16)/	0.94 (0.25)/	< 0.01**/
	13	0.92 (0.28)	0.92 (0.28)	1.00 (0.00)	0.37
16. Suicide attempts are more common among girls, and completed suicides are more common among boys.	78/	0.74 (0.44)/	0.95 (0.22)/	0.95 (0.22)/	< 0.01**/
	13	0.92 (0.28)	1.00 (0.00)	1.00 (0.00)	0.37
17. Talk and contact services increase suicide risk.	78/	0.91 (0.29)/	0.94 (0.25)/	0.94 (0.25)/	0.74/
	13	0.85 (0.38)	0.85 (0.38)	0.92 (0.28)	0.61
18. People who express suicidal intent are not at risk.	78/	0.94 (0.25)/	0.97 (0.16)/	0.99 (0.11)/	0.20/
	13	1.00 (0.00)	1.00 (0.00)	1.00 (0.00)	n.p.
19. Depression can lead to severe physical problems.	78/	0.97 (0.16)/	1.00 (0.00)/	0.99 (0.11)/	0.37/
	13	1.00 (0.00)	1.00 (0.00)	1.00 (0.00)	n.p.
20. In discussions with affected students, confidentiality should be promised to build a more trusting relationship.	78/	0.36 (0.48)/	0.88 (0.32)/	0.91 (0.29)/	< 0.01**/
	13	0.38 (0.51)	1.00 (0.00)	1.00 (0.00)	< 0.01**
21. The focus of performance feedback to depressed students should be his or her skills.	78/	0.82 (0.39)/	0.77 (0.42)/	0.85 (0.36)/	0.21/
	13	0.77 (0.44)	0.92 (0.28)	0.85 (0.38)	0.37
22. Teaching good techniques for dealing with stress can prevent depression.	78/	0.90 (0.31)/	0.88 (0.32)/	0.87 (0.34)/	0.84/
	13	0.92 (0.28)	0.92 (0.28)	0.92 (0.28)	1.00
23. Depression prevention is also suicide prevention.	78/	0.79 (0.41)/	0.95 (0.22)/	0.92 (0.27)/	< 0.01**/
	13	0.85 (0.38)	1.00 (0.00)	1.00 (0.00)	0.14
24. Depression is a treatable medical condition.	78/	0.76 (0.43)/	0.82 (0.39)/	0.79 (0.41)/	0.41/
	13	0.92 (0.28)	0.85 (0.38)	0.85 (0.38)	0.37

Note. Cochran's Q Bonferroni-corrected pairwise comparisons. Sig. = significance; n.p. = multiple comparisons were not performed because the overall test showed no significant differences between samples; original questionnaire is in German.

<sup>a</sup> Scale (recoded): 0 = wrong, 1 = right; <sup>b</sup> = The direction of change for this item indicated a performance decline between pretest, posttest and follow-up or in the pairwise comparisons; 2 = results of study 2, 3 = result of study 3; \*p ≤ .05; \*\*p ≤ .01.



Table 3: Mean, standard deviation, and Cochran's Q of individual items regarding the evaluation of options for actions regarding vignettes of depressed and/or suicidal students in between pretest, posttest, and follow-up ( $n_2 = 78$ ,  $n_3 = 13$ )

Item	Study	N	Pretest M <sup>a</sup> (SD)	Posttest M <sup>a</sup> (SD)	Follow-Up M <sup>a</sup> (SD)	Exact signif. (Cochran's Q)
1. Talking to the parents without the knowledge of the child/adolescent concerned.	2	78	cv1 <sup>b</sup> : 0.55 (0.50) cv2 <sup>c</sup> : 0.40 (0.49)	cv1: 0.35 (0.48) cv2: 0.31 (0.47)	cv1: 0.29 (0.46) cv2: 0.33 (0.47)	cv1: < 0.01** <sup>cd</sup> cv2: 0.28
	3	13	cv1 <sup>b</sup> : 0.77 (0.44) cv2 <sup>c</sup> : 0.85 (0.38)	cv1: 0.46 (0.52) cv2: 1.00 (0.00)	cv1: 1.00 (0.00) cv2: 0.85 (0.28)	cv1: 0.05* <sup>d</sup> cv2: 0.37
2. Discuss the situation with the whole class.	2	78	cv1: 0.92 (0.27) cv2: 0.77 (0.42)	cv1: 0.92 (0.27) cv2: 0.79 (0.41)	cv1: 0.94 (0.25) cv2: 0.95 (0.22)	cv1: 0.93 cv2: < 0.01**
	3	13	cv1: 1.00 (0.00) cv2: 1.00 (0.00)	cv1: 1.00 (0.00) cv2: 1.00 (0.00)	cv1: 0.62 (0.51) cv2: 1.00 (0.00)	cv1: n.p. cv2: n.p.
3. Isolate child/adolescent within the class.	2	78	cv1: 0.99 (0.11) cv2: 0.86 (0.35)	cv1: 0.90 (0.31) cv2: 0.82 (0.39)	cv1: 0.94 (0.25) cv2: 0.83 (0.38)	cv1: 0.04* <sup>d</sup> cv2: 0.71
	3	13	cv1: 1.00 (0.00) cv2: 0.92 (0.28)	cv1: 0.92 (0.28) cv2: 0.85 (0.38)	cv1: 0.92 (0.28) cv2: 0.92 (0.28)	cv1: 0.37 cv2: 0.72
4. Approaching colleagues and consulting with them.	2	78	cv1: 0.51 (0.50) cv2: 0.65 (0.48)	cv1: 0.76 (0.43) cv2: 0.83 (0.38)	cv1: 0.64 (0.48) cv2: 0.76 (0.43)	cv1: < 0.01** cv2: < 0.01**
	3	13	cv1: 1.00 (0.00) cv2: 1.00 (0.00)	cv1: 1.00 (0.00) cv2: 1.00 (0.00)	cv1: 1.00 (0.00) cv2: 1.00 (0.00)	cv1: n.p. cv2: n.p.
5. Consult the school psychology service.	2	78	cv1: 0.79 (0.41) cv2: 0.79 (0.41)	cv1: 0.63 (0.49) cv2: 0.79 (0.41)	cv1: 0.68 (0.47) cv2: 0.91 (0.29)	cv1: 0.30 cv2: < 0.01**
	3	13	cv1: 1.00 (0.00) cv2: 0.92 (0.28)	cv1: 1.00 (0.00) cv2: 1.00 (0.00)	cv1: 1.00 (0.00) cv2: 1.00 (0.00)	cv1: n.p. cv2: 0.37
6. Inform yourself about the topic of depression (and suicidality) on the Internet.	2	78	cv1: 0.63 (0.49) cv2: 0.51 (0.50)	cv1: 0.62 (0.49) cv2: 0.53 (0.50)	cv1: 0.63 (0.49) cv2: 0.49 (0.50)	cv1: 0.97 cv2: 0.81
	3	13	cv1: 0.85 (0.38) cv2: 0.85 (0.38)	cv1: 1.00 (0.00) cv2: 1.00 (0.00)	cv1: 1.00 (0.00) cv2: 1.00 (0.00)	cv1: 0.05* <sup>d</sup> cv2: 0.14
7. Specifically, challenge negative thoughts of the child/adolescent.	2	78	cv1: 0.42 (0.50) cv2: 0.40 (0.49)	cv1: 0.37 (0.49) cv2: 0.36 (0.48)	cv1: 0.44 (0.50) cv2: 0.24 (0.43)	cv1: 0.65 cv2: 0.06
	3	13	cv1: 0.62 (0.51) cv2: 0.62 (0.51)	cv1: 0.38 (0.51) cv2: 0.23 (0.44)	cv1: 0.23 (0.44) cv2: 0.31 (0.48)	cv1: 0.12 cv2: 0.12
8. Promise confidentiality in conversation with the child/adolescent.	2	78	cv1: 0.19 (0.40) cv2: 0.22 (0.42)	cv1: 0.83 (0.38) cv2: 0.87 (0.34)	cv1: 0.87 (0.34) cv2: 0.87 (0.34)	cv1: < 0.01** cv2: < 0.01**
	3	13	cv1: 0.23 (0.44) cv2: 0.31 (0.48)	cv1: 0.92 (0.28) cv2: 1.00 (0.00)	cv1: 1.00 (0.00) cv2: 1.00 (0.00)	cv1: < 0.01** cv2: < 0.01**
9. Look for solutions during the conversation with the child/adolescent.	2	78	cv1: 0.12 (0.32) cv2: 0.00 (0.00)	cv1: 0.56 (0.50) cv2: 0.46 (0.50)	cv1: 0.29 (0.46) cv2: 0.32 (0.47)	cv1: < 0.01** cv2: < 0.01**
	3	13	cv1: 0.00 (0.00) cv2: 0.00 (0.00)	cv1: 0.85 (0.38) cv2: 0.92 (0.28)	cv1: 0.62 (0.51) cv2: 0.69 (0.48)	cv1: < 0.01** cv2: < 0.01**
10. Give the child/adolescent tips on how to handle the situation better.	2	78	cv1: 0.06 (0.25) cv2: 0.09 (0.29)	cv1: 0.36 (0.48) cv2: 0.35 (0.48)	cv1: 0.29 (0.46) cv2: 0.33 (0.47)	cv1: < 0.01** cv2: < 0.01**
	3	13	cv1: 0.08 (0.28) cv2: 0.15 (0.38)	cv1: 0.54 (0.52) cv2: 0.62 (0.51)	cv1: 0.54 (0.52) cv2: 0.54 (0.52)	cv1: 0.01** cv2: 0.01**
11. Emphasize the child's/adolescent's effort in performance feedback.	2	78	cv1: 0.44 (0.50) cv2: 0.38 (0.49)	cv1: 0.22 (0.42) cv2: 0.24 (0.43)	cv1: 0.29 (0.46) cv2: 0.28 (0.45)	cv1: < 0.01** <sup>cd</sup> cv2: 0.04* <sup>d</sup>
	3	13	cv1: 0.77 (0.44) cv2: 0.62 (0.51)	cv1: 0.92 (0.28) cv2: 0.85 (0.38)	cv1: 0.85 (0.38) cv2: 0.92 (0.28)	cv1: 0.55 cv2: 0.12
12. Talking with the child/adolescent about the purpose of suicide.	2	78	cv2: 0.28 (0.45)	cv2: 0.60 (0.49)	cv2: 0.64 (0.48)	cv2: < 0.01**
	3	13	cv2: 0.77 (0.44)	cv2: 1.00 (0.00)	cv2: 0.92 (0.28)	cv2: 0.17

Note. Cochran's Q Bonferroni-corrected comparisons. Signif. = significance; n.p. = multiple comparisons were not performed because the overall test showed no significant differences between samples; original questionnaire is in German.

<sup>a</sup> Scale (recoded): 1 = wrong, 0 = right; <sup>b</sup> = case vignette 1 of a depressed student; <sup>c</sup> = case vignette 2 of a depressed and suicidal student; <sup>d</sup> = The direction of change for this item indicated a performance decline between pretest, posttest and follow-up or in the pairwise comparisons; \* $p \leq .05$ ; \*\* $p \leq .01$ .

## Satisfaction with training

In both studies 2 and 3, the overall feedback on the teacher training is similar and, for the most part, positive. The discussion of cases, the practical relevance of the topic, and the clear presentation of the subject are highlighted. Room for improvement is named regarding the length of the training in the sense that more time would allow more questions and room for discussions. Also, a wish for more case examples is expressed.

## Discussion

The *glücklich* training program was developed for the professional development of teachers regarding depression in childhood and adolescence. The formative study (study 1) and two summative studies (studies 2 and 3) reported in this paper were carried out to pilot and evaluate *glücklich* for further improvement before conducting a randomized control study.

Results indicate that *glücklich* has a positive effect on several variables. Significant improvements in *depression literacy* as well as *action knowledge* were observed one day after training [T2] and shown to be retained in the follow-up [T3] one month after the training in both summative studies. Studies 2 and 3 showed that significant, time-stable changes can be achieved with a short program such as *glücklich*, particularly concerning knowledge about depressive symptoms, the processes by which depression develops, and the relationship between depression and suicidality. This knowledge is of primary importance for a comprehensive knowledge of this mental illness. Without such a comprehensive understanding, teachers are not able to help depressed and/or suicidal students effectively. Moreover, participants especially benefitted from learning how to conduct a conversation with a depressed and/or suicidal student. This result proves the importance of a program like *glücklich*, because there seem to be gaps within tea-

chers' knowledge on how to talk to a student they are concerned about appropriately. Initiating such a conversation, however, is an essential first step in the help process. Participants' self-confidence to recognize and deal with psychological stress in students and the knowledge of where to get support also increased significantly after the training. This was still present in the follow-up survey one month after the implementation of the training program. These results show an increased self-efficacy of the study participants, which at the same time contributes to the preventive effect of such a program. It is particularly interesting to note that a short intervention like *glücklich* can achieve and maintain large effects in this important area, which is detrimental for preventing and facilitating help for affected students.

Compared to other programs (Ahnert et al., 2016; Martínez et al., 2015; Moor et al., 2007), *glücklich* seems to cope successfully with existing problems. Thus, dropouts can be avoided due to the time-efficient implementation. Furthermore, besides teaching only knowledge about depression, action knowledge is successfully taught, which is especially important for everyday school life.

The reported studies are evaluation studies. In the next step, a randomized controlled trial will be conducted. Before that, the program will be revised again. In addition to the reported results of the questionnaire, feedback from the participants will also be taken into account for the revision.

The following eight limitations should be considered when interpreting the results: Firstly, the COVID-19 restrictions made it impossible to conduct the *glücklich* training in person, as initially planned. Therefore, the participants had limited interaction with the trainer, and not all of the planned didactic methods could be implemented. Secondly, only  $n = 7$  trained teachers participated in the training because of COVID-19. Thus, it is not possible to make conclusive judgments for trained teachers based on the results reported in this paper, which are

Table 4: Changes in the subjective competence to act regarding depressed and/or suicidal students from pretest to posttest to follow-up ( $n_2 = 78$ ,  $n_3 = 13$ )

Item	$n_2/n_3$	Pretest	Posttest	Follow-Up	$F^{2/3}$	$df^{2/3}$	$p^{2/3}$	$\eta^{2,2/3}$
		$M^a (SD)^{2/3}$	$M^a (SD)^{2/3}$	$M^a (SD)^{2/3}$				
1. I feel competent regarding my knowledge of depressive symptoms and disorders in childhood and adolescence.	78/	2.08 (0.68)	2.92 (0.45)	2.86 (0.42)	97.39	2	< 0.01**	0.558
	13	2.15 (0.80)	2.92 (0.28)	3.00 (0.41)	12.11	2	< 0.01**	0.502
2. I feel competent in recognizing depressive symptoms in students.	78	2.08 (0.75)	2.79 (0.49)	2.81 (0.51)	60.54	2	< 0.01**	0.440
	13	2.15 (0.69)	3.08 (0.49)	3.08 (0.49)	13.40	2	< 0.01**	0.624
3. I know how to take action when I notice depressive symptoms in a student.	78	2.00 (0.68)	3.19 (0.54)	3.06 (0.61)	122.99	2	< 0.01**	0.615
	13	2.00 (0.82)	3.62 (0.65)	3.54 (0.52)	36.61	2	< 0.01**	0.795
4. I know what help is available for depressed students and how to get it.	78	1.97 (0.60)	3.15 (0.61)	3.13 (0.52)	149.24	2	< 0.01**	0.660
	13	1.77 (0.73)	3.54 (0.66)	3.54 (0.66)	43.18	2	< 0.01**	0.806

Note. Bonferroni-corrected repeated-measures analysis of variance (ANOVA); original questionnaire is in German.

<sup>a</sup> Scale: 1 = do not agree, 2 = partially do not disagree, 3 = partially agree, 4 = agree; <sup>2</sup> = study 2, <sup>3</sup> = study 3; \*\* $p \leq .01$ .

mainly based on teacher training students. It is possible that the teacher training students already knew more about childhood and adolescent depression than trained teachers because of the modules they took recently within their degree. Thirdly, the sample consisted of primarily female teacher training students. Therefore, results cannot be generalized to other genders. Fourthly, because all three studies were pilot studies, no control group was used. Some results may not be exclusively attributable to the intervention. Fifthly, *subjective action competence* was only surveyed in self-rating, and no objective external criterion (e.g., student survey about teacher behavior, behavioral observation in class) was used. No statement can be made about whether the study participants will put what they have learned into practice. Sixthly, due to a high dropout rate in both summative studies at the third measurement point [T3], it cannot be ruled out that only those who rated the training positively and claimed that they had learned a lot from it participated (selective dropout) in the follow-up questionnaire. Seventhly, the questionnaire used is not a standardized instrument but a self-developed one. There-

fore, because the evaluation studies were not only performed with the target group (teachers) and the questionnaire will be revised again, there is no fixed classification of results and conclusive psychometric data yet. Eighthly, there is a need to optimize the survey instrument: Ceiling effects were observed for several items of the *depression literacy* and the *action competence* section of the questionnaire. It is, therefore, necessary to revise the questionnaire.

Overall, the results of the *glücklich* pilot studies are promising. A future control group study will assess the training in a gender-diverse sample of qualified teachers in a face-to-face setting.

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**Korrespondenzadresse:****Friederike C. Grabowski**

Auf dem Campus 1

D-24943 Flensburg

[friederike-carlotta.grabowski@uni-flensburg.de](mailto:friederike-carlotta.grabowski@uni-flensburg.de)

Friederike C. Grabowski

<https://orcid.org/0000-0002-8559-3874>

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