

# Exploring the readiness of youth education institutions with high-risk students to implement a suicide prevention gatekeeper intervention: A nationwide observational survey study in Denmark

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## Abstract

Danish schools offering “preparatory basic education and training” (FGU schools) have students that are characterized by having different academic, social, or personal problems. In addition, many FGU students are at high risk of suicidal behavior. Many young people with suicide behavior do not seek help and early identification is important for suicide prevention. Teachers are in a position where it could be relevant to implement a gatekeeper intervention. To ensure successful implementation of an intervention, it is important to establish organizational readiness for change, including its innovation-specific capacity, which are the facilitating requirements in the organization specific to the intervention. We aimed to explore the innovation-specific capacity to implement a gatekeeper intervention at FGU schools in Denmark. This study is based on an online survey completed by teaching staff ( $n = 251$ ) at FGU schools to explore their overall knowledge about and experience with students' suicidal behavior. Limited knowledge of suicide prevention was found among teaching

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staff. Most knowledge was from personal experience. There is a need for teaching staff to be educated about suicidal behavior. There is a lack of innovation-specific capacity to implement a gatekeeper intervention.

#### KEYWORDS

gatekeeper, organizational readiness, prevention, school staff, suicide

#### Practitioner Points

- Teachers in Denmark lack knowledge about suicidal behavior.
- Teachers need education to meet the innovation-specific capacity to be able to implement a gatekeeper intervention at schools.
- Nearly half of teachers have experienced students with suicidal behavior.

## 1 | BACKGROUND

Each year more than 700,000 people globally lose their life to suicide, and suicide is a leading cause of death in young people aged 15–25 years (WHO, 2021c). In Denmark, the number of suicides has declined by 70% in this group from 1980 to 2007 and has since remained unchanged (Centre for Suicide Research, 2022). Per 100,000 in the group aged 15–25 years, there was a rate of 7 suicides and 141 suicide attempts in Denmark in 2020 (Centre for Suicide Research, 2022).

The World Health Organization (WHO) has previously estimated that for every suicide or suicide attempt 5–10 relatives or friends are affected (Azorina et al., 2019). People bereaved by suicide are at an increased statistical risk of developing physical and mental health problems, including suicide and suicide attempts (Azorina et al., 2019). The WHO member-states have agreed to work toward reducing the suicide rate by one-third by 2030 (WHO, 2021a). WHO has advocated for the importance of schools as arenas for health promotion, which has led to a significant number of school-based health interventions, such as the UK Resilience Program and the Healthy Lifestyle Program (HeLP) (Pearson et al., 2015). However, to date, no universal school-based intervention has targeted suicide behavior in Denmark (Jeppesen et al., 2020).

Suicide is multicausal and the end product of a range of interactions of biological, clinical, psychological, social, cultural risk, and protective factors (O'Connor & Kirtley, 2018), which is why preventive interventions should target different areas of behavior and etiology (Nordentoft, 2007). In its "Comprehensive Mental Health Action plan (2013–2030)," WHO suggested implementation of school-based suicide prevention initiatives tailored to at-risk groups through the training of teachers and social workers, for example, in assessing, managing and following up on suicidal behavior (WHO, 2021a).

Many young people with suicide behavior do not seek help, possibly because of stigma, shame, embarrassment, and limited mental health knowledge (Calear et al., 2022). The early identification of students at risk is important for suicide prevention (Torok et al., 2019). Because teachers are in daily contact with students, they are in a position (Hatton et al., 2017) where it could be relevant to implement a gatekeeper intervention (Mo et al., 2018). School-based gatekeeper training has previously shown to be effective in improving the participants' knowledge, skills, self-efficacy, and likelihood to intervene (Mo et al., 2018).

Gatekeeper training increases the knowledge of the warning signs of suicidal behavior, while developing intervention skills and knowledge of resources for referral (Lancaster et al., 2014; Mo et al., 2018; Torok et al., 2019). The aim of gatekeeper training is to increase peoples' self-efficacy and ability to intervene (e.g., to

instill the confidence to talk about suicide and respond to a suicidal crisis) (Breet et al., 2021). Increasing teachers' self-efficacy can encourage behavior change including gatekeeper behavior (e.g., recognizing suicidal behavior and being able to refer to suitable help) (Breet et al., 2021; Stickl Haugen et al., 2022).

The Danish government implemented a new public Preparatory Basic Education and Training (FGU) in 2019 (Ministry of Children and Education, 2018). The schools help to develop personal social skills, prepare young people between the ages of 15 and 25 to start and continue secondary school education, or to get into employment. The students attending FGU schools are not qualified or ready to attend traditional secondary schools in the education system or to be employed. The students at FGU schools are characterized by having different academic, social, or personal problems. More than one-third of the students attending FGU schools have been in contact with a psychiatric department, but there are no studies on suicidal behavior among students enrolled at FGU schools. These students are more often affected by factors that increase their risk of suicide behavior, such as low self-esteem, substance abuse issues, academic problems, and being victims of bullying (The Danish Evaluation Institute, EVA, 2017), thus, being a population at high risk. Based on these risk factors, FGU schools could be relevant organizations for suicide prevention by implementing a school-based gatekeeper intervention.

There is evidence that supports the efficacy of school-based suicide prevention (Walsh et al., 2022), but the outcome of a school-based intervention depends on the level and the quality of the implementation (Darlington et al., 2018). Implementation relies on the complex interactions between the contextual factors (Darlington et al., 2018), which has seldomly been scientifically researched in the field of suicide prevention (Walsh et al., 2023). The characteristics of the intervention itself and the stakeholders, are two of the contextual factors that are of influence (e.g., school organization, students' characteristics, and teacher training and support) (Barry & Rachel, 2007; Darlington et al., 2018) As part of early identification of suicidal behavior, it is important to consider school staff and organizational capacity to implement a suicide prevention intervention, for example, training (WHO, 2021b).

Both the organization and key elements of the intervention should be considered in an exploration, that assess the organization's resources, population characteristics, needs, and organizational readiness for change (Bertram et al., 2015). Organizational readiness to implement is related to whether the members of an organization feel committed to a change in the organization, and are convinced of their overall abilities for change (Randall et al., 2019). Scaccia et al. (2015) proposed that readiness involves the following three areas: "(1) the motivation to implement an intervention, (2) the general capacities of an organization, and (3) innovation-specific capacities." Motivation can be defined as people's interest in doing the required activities and an organization's general capacity, which is related to the overall organizational characteristics and the innovation-specific capacity: that is, the conditions that are needed within the organization to facilitate implementation (Scaccia et al., 2015). Innovation-specific capacities are specific to the intervention that is being implemented (Scaccia et al., 2015), which could include the skills of the school staff, and the knowledge and competences necessary to implement a school-based gatekeeper intervention. Innovation-specific is some of the first to be investigated and established.

## 2 | AIM

The aim of the present study was to examine the innovation-specific capacity to implement a school-based gatekeeper intervention in FGU schools in Denmark.

## 3 | METHODS

### 3.1 | Study design

We conducted a descriptive cross-sectional study, which included both quantitative and qualitative data collected from a survey. The survey was delivered through email, which included a self-creation link to set up

an online questionnaire. The email was sent to all FGU schools in Denmark with a request to forward it to employed teachers. One reminder email was sent two weeks after. Data were collected from January 20, 2021, to February 14, 2021. The study was registered at the University of Southern Denmark and complied with the Danish data protection law §10 (voluntary participation and informed consent).

## 3.2 | Measurements

The survey was conducted in SurveyXact. The questionnaire consisted of both closed and open-ended items, covering demographic characteristics: knowledge about suicidal behavior, intervention skills, knowledge about referral resources, previous experience with suicidal behavior in students and self-perceived knowledge, and skills and shortcomings to manage students with suicidal behavior. Table 1 shows a description of the constructs of innovation-specific capacity to implement, which consists of experiences with students with suicidal behavior, and knowledge and skills to manage students with suicidal behavior. Table 1 shows what type of data, quantitative or qualitative, was used to get information on each construct.

## 3.3 | Participants

A total of 303 questionnaires were set up online. Two were excluded due to missing informed consent, 50 were excluded because of unanswered items in the questionnaire (i.e., not all the closed-ended items had been answered), and two were excluded because they had been completed by management employees. Thus, 251 completed questionnaires were included in this study. No statistically significant differences were evident between the population included in the study and the 38 excluded that had filled in the gender and place of employment items. A total of 173 of the 251 questionnaires were included in the qualitative part of this study. No statistically significant differences were found for gender, place of employment, and seniority between the included and the excluded populations.

## 3.4 | Quantitative data and the analysis

### 3.4.1 | Variables and outcomes

The outcome “knowledge about suicide” consisted of three levels: *no knowledge*, *moderate knowledge*, and *high knowledge*. These levels were based on the answers to the five items on knowledge about “risk factors,” “protective factors,” “warning signs,” “places for referral,” and “having the skills to talk about suicidal behavior or thoughts about suicide.” *No knowledge* was defined as having answered “no” to all of the above. *Moderate knowledge* was defined as having answered “yes” to at least one (and up to three) of the five items above, and *high knowledge* was defined as having answered “yes” to four or five of the items.

“Seniority” was divided into two categories: having more than 2 years of seniority working with adolescents and young adults in the target group of FGU schools, or having up to 2 years of seniority.

“Experienced suicidal behavior” was defined as having experienced (or found) students who had attempted or died by suicide. “Observed suicidal behavior” was defined as having encountered students whom, they perceived as having suicidal behavior. The outcome variable, “Actions to be taken by the teachers,” in case of concerns about a student was divided into four categories: “ask in school,” “ask the student or relatives,” “ask outside of the school,” or “ask somewhere else.”

TABLE 1 Definition of innovation-specific capacity and data used to analyze subdimensions.

Innovation-specific capacity		Experience										
Subdimension	Knowledge	Having knowledge about places of referral.	Having knowledge about warning signs for suicidal behavior.	Having knowledge about protective factors for suicidal behavior.	Having knowledge about risk factors for suicidal behavior.	Having knowledge about protective factors for suicidal behavior.	Having knowledge about warning signs for suicidal behavior.	Having knowledge about places of referral for a person with suicidal behavior.	Skills that enable to intervene on a person who has suicidal behavior or is at risk of suicide.	Having the skills to talk about suicidal behavior or thoughts about suicide.	Having experienced (or found) students who had attempted or died by suicide.	Having encountered students, that the respondent perceived as having suicidal behavior.
Formal definition		Having knowledge to acknowledge a person at risk of suicidal behavior.	Having knowledge about protective factors for suicidal behavior.	Having knowledge about risk factors for suicidal behavior.	Having knowledge about warning signs for suicidal behavior.	Having knowledge about places of referral for a person with suicidal behavior.	Having knowledge about warning signs for suicidal behavior.	Having knowledge about places of referral for a person with suicidal behavior.	Skills that enable to intervene on a person who has suicidal behavior or is at risk of suicide.	Having the skills to talk about suicidal behavior or thoughts about suicide.	Having experienced (or found) students who had attempted or died by suicide.	Having encountered students, that the respondent perceived as having suicidal behavior.
Data												
Quantitative data	X	X	X	X	X	X	X	X	X	X	X	X
Qualitative data	X	X	X	X	X	X	X	X	X	X	X	X

### 3.4.2 | Statistical analysis

The Kuder-Richardson 20 (KR20) was used to measure the internal reliability of the items in the survey (Polit & Yang, 2016).

A prevalence analysis was conducted for the demographic variables and the teachers' experiences with suicidal behavior among the students. The relationship between the included and excluded population in this study was examined through test of independence by Pearson's  $\chi^2$  test. The relationship between employment type and having experienced suicidal behavior, and the actions to be taken by the teacher, was examined through the  $\chi^2$  test of independence.

Multinomial logistic regression was used to estimate the effect of employment type, sex, age group, having experienced suicidal behavior and seniority on the level of knowledge about suicidal behavior among the teaching staff. A comparison of differences between the effects of having no, moderate, and high knowledge of suicidal behavior was made. Five percentage was used as the level of significance. The quantitative data were analyzed with SAS (Statistical Analysis System). We used the proc logistic in SAS for estimating the effects in the multinomial logistic regression model. The effects were estimated by using two different models: a crude model that only included the independent factor and the outcome; and an adjusted model that included all the independent factors and the outcome.

## 3.5 | Qualitative data and the thematic analysis

Qualitative data from the open-ended items was analyzed to obtain more detailed knowledge about the constructs, teachers' knowledge, and teachers' experiences with suicidal behavior in students. The qualitative data were collected and analyzed in Danish and are reported in English in this paper. The translation of the data was done using Microsoft Bing Translator and was subsequently manually assessed and corrected for inaccuracies in translation and interpretation by the first author to minimize the risk of losing nuances. The qualitative data from the open-ended items was analyzed using a thematic analysis approach. Virginia Braun and Victoria Clarke describe the advantages of the thematical analysis as allowing for social and psychological interpretation and the possibility of unanticipated insights. The thematical analysis strategy consists of six stages (Braun & Clarke, 2006). Keywords and short phrases were coded and developed into subthemes and themes. The analysis process went from reading the material, performing inductive coding, and extracting text to identify sub-themes. Finally, essential elements in each subtheme were identified, defined, and labeled.

## 4 | RESULTS

The internal reliability of the items in the survey had a KR20 of .73 overall and of .86 for the items on knowledge of suicidal behavior.

### 4.1 | Descriptive statistics

Table 2 shows the characteristics of the employees who answered the survey. The study population consisted of 251 employees who provide education to young people in FGU schools located in all five regions of Denmark. A total of 66.1% were female and 33.9% male. The mean years of seniority working with young people in the FGU segment was 7 years and 3 months, and the median was 4 years. A total of 42.6% had experienced suicidal behavior among students; 7.2% had experienced students who died by suicide, 37.9% had experienced students who

**TABLE 2** Descriptive statistics.

Variable	Category	n = 251	%
Sex	Female	166	66.1
	Male	85	33.9
Age	≤39 years	63	25.1
	>39 years	188	74.9
Region of employment	Capital Region of Denmark	80	31.9
	Central Denmark Region	59	23.5
	North Denmark Region	36	14.3
	Region Zealand	14	5.6
	Region of Southern Denmark	62	24.7
Type of employment	General teacher	64	25.5
	Crafts teacher	73	58.2
	School counselor	43	17.1
	Workshop teacher	62	24.7
	Others	9	3.6
Years of experience	Lowest	0 years	
	Highest	43 years	
	Mean	7 years and 3 months	
	Median	4 years	
Seniority	Up to 2 years	111	44.2
	More than 2 years	140	55.8
Experienced suicidal behavior among students		107	42.6
	Found one or more students who attempted suicide	11	4.4
	Have experienced there are students who have attempted suicide	95	37.9
	Have experienced there are students who have died by suicide	18	7.2
Observed suicidal behavior		141	56.2

attempted suicide, and 4.4% had found one or more students who attempted suicide. A total of 56.2% reported having observed suicidal behavior among students (Table 3).

## 4.2 | Test of independence and regression analysis

Table 3 displays the results of the multinomial logistic regression analyses, including crude and adjusted estimates of effects. In the crude models, we found that young teachers were more likely to have low or moderate knowledge about suicidal behavior compared to older teachers. Teachers with high seniority or who had experienced students

**TABLE 3** Multinomial regression analysis of the effect of variables on the level of knowledge about suicidal behavior ( $n = 251$ ).

Variable (%)	Multinomial logistic regression (crude estimates)		Multivariate multinomial logistic regression (adjusted estimates)	
	Moderate knowledge OR (95% CI)	High knowledge OR (95% CI)	Moderate knowledge OR (95% CI)	High knowledge OR (95% CI)
Female, $n = 166$ (66.1)	1.03 (0.50–2.09)	1.29 (0.64–2.58)	1.05 (0.48–2.29)	1.02 (0.45–2.31)
Young: age $\leq 39$ years, $n = 63$ (25.1)	1.61 (0.74–3.52)	0.83 (0.38–1.85)	2.01 (0.86–4.69)	1.25 (0.50–3.12)
Seniority $> 2$ years, $n = 140$ (55.8)	1.23 (0.62–2.45)	2.49 (1.27–4.89)*	0.86 (0.40–1.86)	1.29 (0.58–2.88)
Experienced suicidal behavior, $n = 107$ (42.6)	2.42 (1.10–5.32)*	4.64 (2.16–9.96)**	1.82 (0.72–4.58)	1.66 (0.66–4.15)
Observed suicidal behavior, $n = 141$ (56.2)	2.68 (1.26–5.69)*	10.75 (4.96–23.30)**	1.77 (0.74–4.28)	7.56 (3.06–18.71)**
Employment type, $p = .0166$				
General teacher, $n = 64$ (25.5) (reference)	1	1	1	1
Crafts teacher, $n = 73$ (29.1)	2.32 (0.97–5.54)	1.79 (0.76–4.21)	1.95 (0.77–4.94)	0.81 (0.30–2.16)
Workshop teacher, $n = 62$ (24.7)	3.35 (1.62–8.87)	2.87 (1.11–7.45)	2.75 (0.95–7.90)	1.22 (0.40–3.68)
School counselors, $n = 43$ (17.1)	4.63 (1.13–18.87)	8.92 (2.37–33.59)*	3.23 (0.76–13.81)	3.46 (0.83–14.47)
Other, $n = 9$ (3.6)	0.77 (0.12–5.12)	1.28 (0.26–6.36)	0.59 (0.09–4.09)	0.84 (0.13–5.28)

Abbreviations: CI, confidence interval; OR, odds ratio.

\* $p < .05$ ; \*\* $p < .001$ .



with suicidal behavior were more likely to have high knowledge about suicidal behavior, respectively (odds ratio [OR]: 2.49\*) and (OR: 4.64\*\*). The highest crude effect (OR: 10.75\*\*) was found for teachers who reported to have observed suicidal behavior, and they were more likely to have a high level of knowledge. Regarding the type of employment, school counselors were more likely to have a high level of knowledge compared to general teachers. In general, the ORs were higher in the high knowledge group compared to the moderate knowledge group.

In the adjusted model, only the OR from “observed suicidal behavior” on high knowledge was significant (OR: 7.56\*\*), which could explain most of the variation.

As seen in Table 4, employment type was statistically significant because this is associated with having experienced students with suicidal behavior. The observed number of 27 school counselors who reported to have experienced students with suicidal behavior was higher than expected, whereas the observed 18 among general teachers was lower than the expected. Teachers with a seniority of more than 2 years were also significantly more likely to have experienced students with suicidal behavior compared to those with less. A statistically significant association was seen between employment type and talking with the student or relatives about concerns or asking outside the school for guidance or help. The observed number of 35 school counselors who would ask students or relatives was higher than expected, whereas the observed number of 32 among general teachers was lower than expected.

### 4.3 | Analysis of qualitative data

The analysis revealed three main themes, but two were excluded as they did not answer the aim of this study. Table 5 shows the results from the thematic analysis of the qualitative data. The remaining main theme was describing the nature and extent of the teachers' knowledge about suicidal behavior. This main theme emerged from the subthemes: “limited knowledge of specific individual factors,” “personal experience and self-learned knowledge of suicidal behavior,” “unsure of their knowledge of suicidal behavior,” and “much focus on mental illness.”

The innovation-specific capacity is depicted in the nature and extent of the teachers' knowledge about suicidal behavior. The following are examples of answers to the question: “Do you know which factors increase the risk of suicidal behavior?”:

Among others, depression. (P162)

I know some, but far from everyone! My experience is primarily with students with poor self-esteem after various kinds of failures, both from family, but unfortunately also from the system. (P149)

These quotes show how the teachers at FGU schools have limited knowledge and often it is from personal experience and self-learned knowledge. The teachers' insecurities and limited knowledge can be seen in the following example of the answer to the question, “Do you know where to refer a student with suicidal behavior?”

Yes and no. In the case of a student who had a contact within a psychiatric department, I contact them. But otherwise, I probably don't know who to contact, other than my manager or the school's student coordinator. (P55)

This quote shows the respondent's insecurity by answering “yes and no.” This teacher does not seem to have knowledge about the possibility of using phone crisis hotlines or contacting the psychiatric emergency departments.

The responding teachers give the impression that they have limited knowledge of suicidal behavior and that their existing knowledge is mainly obtained from personal experience, a finding that substantiates the results from the quantitative analysis.

**TABLE 4** Pearson's  $\chi^2$  test of the relationship between gender, age, seniority employment type, and having experienced suicidal behavior.

Variable (%)	Experienced suicidal behavior		Would ask in school		Would ask student or relatives		Would ask for help outside the school		Would ask for help elsewhere	
	Observed frequency (%)	Expected frequency	Observed frequency (%)	Expected frequency	Observed frequency (%)	Expected frequency	Observed frequency (%)	Expected frequency	Observed frequency (%)	Expected frequency
Employment type	107 (42.3)*		234 (93.2)		165 (64.7)*		179 (71.3)*		33 (13.1)	
General teacher, n = 64 (25.5)	18 (28.1)	27	61 (95.3)	60	32 (50.0)	42	39 (60.9)	46	5 (7.8)	8
Crafts teacher, n = 73 (29.1)	33 (45.2)	31	68 (93.2)	68	48 (65.8)	48	51 (69.9)	52	9 (12.3)	10
Workshop teacher, n = 62 (24.7)	26 (41.9)	26	58 (93.6)	58	45 (72.6)	41	46 (74.2)	44	7 (11.3)	8
School counselor, n = 43 (17.1)	27 (62.8)	18	38 (88.4)	41	35 (81.4)	28	38 (88.4)	31	11 (25.6)	6
Other, n = 9 (3.6)	3 (33.3)	4	9 (100)	8	5 (55.6)	6	5 (55.6)	6	1 (11.1)	1
Female, n = 166 (66.1)	77 (46.4)	71								
Young ( $\leq 39$ years), n = 63 (25.1)	21 (33.3)	27								
Seniority > 2 years, n = 140 (55.8)	81 (57.9)*	60								

Note: The relationship between employment type and what actions taken (n = 251).

\*p < .05.

**TABLE 5** Thematic analysis and the process from extracted text to subthemes to themes.

Theme	
The nature and extent of the teachers' knowledge about suicidal behavior	
Subtheme	Extracted data
Much focus on mental illness	"Various psychiatric diagnoses." (P191) "Currently I have a student who is hospitalized after several suicide attempts. She has borderline and anxiety. She acts on impulse. Often mental illness is a contributing factor." (P90)
Limited knowledge of specific factors	"Utterance of desire for suicide – I do not know others" (P158) and "Loneliness, bullying, mental health challenges, lack of support, loss" (54) or "Among others depression" (P162) and "Meaningful relationships" (P120)
Personal experience and self-learned knowledge of suicidal behavior	"We saw a specific case at the school where we involved the police. Since then, we now have got a procedure for what actions should be taken in similar cases." (P54)
Unsure of their knowledge of suicidal behavior	"Yes and no. In the case of a student who had a contact with the psychiatric department, I contact it. But otherwise, I probably don't know who to contact, other than my manager or the school's student coordinator." (P55) "I know some, but far from everyone! My experience is primarily with students with poor self-esteem after various kinds of failures, both from family, but unfortunately also from the system." (P149)

## 5 | DISCUSSION

### 5.1 | Main findings

This study found that the FGU schools *lack innovation-specific capacity* regarding an implementation of a suicide prevention gatekeeper concept. The quantitative analysis indicates a low level of knowledge about suicidal behavior. The qualitative analysis strengthened the quantitative results which showed that the teachers at FGU schools have limited knowledge about suicidal behavior. School counselors appeared to more often to have knowledge of suicidal behavior than the other employment types.

In this study, FGU schools in all five regions of Denmark were represented. More than half of the teachers at FGU schools reported having observed suicidal behavior in students, and almost half (mainly school counselors) had experienced suicidal behavior among the students. We found a lower percentage than Westefeld et al. (2007) of teachers who had experienced suicidal behavior and had observed suicidal behavior, which may be explained by the teachers included in their study having longer teaching experience and having worked in high schools. The purpose of Westefeld et al.'s (2007) study was to investigate beliefs, knowledge, attitudes, and opinions of high school teachers concerning the issue of adolescent suicide in the Midwest, United States. The study found that 92.6% of school teachers would ask in school if they were concerned about a student, and 49.2% would ask the student or their relatives, which is similar to our results (Westefeld et al., 2007). A study by Lamis et al. (2016) found that 70.3% had never suspected that a student's behavior in the past year indicated that they had considered suicide. However, the participants in their study may not have had the same degree of voluntariness as in our study, as they participated in a state-required training program, which might suggest that these study populations are not directly comparable.

Our results shows that there is a lack of innovation-specific capacity to implement a gatekeeper intervention, which corresponds to Groschwitz et al.'s (2017) findings, that the level of knowledge differed between professions, with teachers having the lowest level of knowledge. Groschwitz et al.'s (2017) study targeted school staff from

secondary schools with students aged 10–20 years and investigated the effect of voluntary and free of charge, 2-day workshops on gatekeeper behavior. Additionally, similar to our results, Lamis et al. (2016) found that guidance counselors in schools had a high degree of knowledge of suicidal behavior, whereas teachers had the lowest. Their study investigated knowledge, attitudes, and self-efficacy pre- and postonline gatekeeper training of school faculty and staff. Lamis et al. (2016) assessed knowledge on the basis of 15 items (8 multiple-choice, 7 true/false items). When comparing Lamis et al.'s results to our study, which consisted of evaluating knowledge of the basis of only five items plus the analyses of the qualitative data gathered through open-ended questions, we may have underestimated the knowledge level of our respondents.

We found that school counselors have more knowledge than general teachers on how to ask students or relatives about suicidal behavior. Similarly, Soja Santos et al. (2022) also concluded that teachers need to be educated or become qualified to be able to approach students with suicidal behavior. Their qualitative study investigated teachers' knowledge about suicidal behavior in adolescents. Similar to our study, they focused on a state school, but the pupils were younger, between 9 and 17 years old. Furthermore, they were not categorized as being adolescents and young adults with academic, social and/or personal problems.

The OR in the adjusted model from the school counselors on moderate knowledge (OR: 3.23) and high knowledge (OR: 3.46) was not significant but could have explained some of the variation, this can be explained by the fact that the school counselors also were those who were significantly associated with having experienced students with suicidal behavior.

## 5.2 | Implications

In our study, the backgrounds and roles of the teachers are different than those found in traditional, vocational schools, high schools, or secondary schools because of both the purpose of FGU schools and the characteristics of the students attending them. The FGU schools offer a range of subjects from academic subjects such as mathematics and English, but also, for example, workshop training. Therefore, the teaching staff have diverse functions and a much broader background, such as carpenters, industry trades people, black smiths, and social pedagogues. To our knowledge, this is the first study that has included investigating nonacademic teaching staff's knowledge and experience with suicidal behavior who teach high-risk students. Teachers with a nonacademic background have a different education that often does not cover pedagogical and social features, which could affect their knowledge about suicidal behavior. More research in the field of implementation science and suicide research is relevant for staff working with high-risk students, both to gather knowledge about how facilitators and barriers for the implementation of a suicide prevention gatekeeper intervention can be overcome, and to identify which strategies could be important for its implementation.

Many school-based suicide prevention interventions aimed at adolescent and young adults exist, but Denmark has no national policy on suicide prevention in schools. Several of the students attending FGU schools meet a variety of barriers, such as academic and social challenges, difficulty with the surrounding environment and life circumstances, which all are factors that increase the risk of suicidal behavior. Moreover, many FGU students do not seek help and may be cautious about "adults" as they have many bad experiences with the "establishment" and being let down. Implementing a gatekeeper intervention would be relevant, but it would encompass a training program that is adapted to the context of the FGU schools.

Implementation studies have their primary focus on examining which strategies strengthen interventions to become part of the practice and ensure their sustainability (Bauer & Kirchner, 2020). This study investigates parts of the implementation, which is crucial for the effect of a future intervention. Conducting thorough research before implementing an intervention is often an overlooked but essential and important step. Little is known about the strategies for implementing interventions that target suicide prevention programs (Nadeem et al., 2011) because implementation-focused research in this field has not been

conducted in relation to the adaptation of the implementation science frameworks and the testing of the implementation strategies (Reifels et al., 2022). Suicide prevention interventions need to be strengthened through implementation science to close the gap between research and practice (Reifels et al., 2022), which will affect that research, and scientific experiences are more easily transferred into practice through real world settings. The systematic investigation of factors that lead to implementing of evidence-based practice and the using of this information to develop implementation interventions is known to increase the effectiveness of an intervention (Richards & Hallberg, 2015). Future research should focus on ensuring evidence-based capacity building, for example, through investigating the general capacity and motivation at the organizational level at FGU schools, which could serve as a basis for adopting preventive strategies and implementing an intervention.

### 5.3 | Strengths and limitations

Since the present study is a descriptive cross-sectional study, it can report on possible associations, but it cannot demonstrate causal relationships. Thus, the study design allows us to establish only that the school counselors have a higher level of knowledge than the teachers, but not why or how. One limitation is that the data are self-reported, which holds a risk of social desirability bias, yet we regard self-reporting as the best way to gather this kind of information. To our knowledge, no selection of recipients was performed by the schools before the distribution of the survey. However, the risk of selection bias is a limitation, as it was not possible to control who received the invitation email to participate in the survey. However, the participants did represent all five regions of Denmark. An additional limitation was that we did not ask about previous suicide prevention training. This information could have strengthened the generalizability of the knowledge level (assumed for all FGU teachers), especially if our respondent sample had a special interest in the subject due to previous knowledge.

Qualitative studies are especially applicable for the exploration of barriers and facilitators for implementation including organizational readiness and the innovation-specific capacity because these give insight into, and knowledge and understanding of, the organization and practice (Richards & Hallberg, 2015). Similarly, qualitative studies and methods can be used where the quantitative studies alone cannot explain the results (Hamilton & Finley, 2019). The use of both quantitative and qualitative data that complement each other enriches the evidence and enables the extension of the answer to a question (Shorten & Smith, 2017). In our study, the results from the qualitative data complemented and extended those from the quantitative data. For example, one result indicates a low level of knowledge about suicidal behavior among general teachers. Additionally, this knowledge often stems from personal experience and is limited to specific factors, as illustrated in the following quote: "Utterance of desire for suicide – I do not know others" (P158).

This study is the first of its kind in Denmark to describe teacher experiences with and knowledge of suicidal behavior in a high-risk student population. An important strength is that staff from FGU schools from all five regions of Denmark are represented, and thus, the results provide good insight into the innovation-specific capacity to implement a gatekeeper intervention.

## 6 | CONCLUSION

This study shows that teaching staff need to be educated to meet the innovation-specific capacity at FGU-schools to be able to implement a gatekeeper intervention. Further studies of the organizational readiness are needed to investigate the general capacity and motivation. Moreover, the readiness at both the organizational and leadership levels should be explored to ensure successful implementation of a suicide prevention intervention in the future.

## CONFLICT OF INTEREST STATEMENT

The authors declare no conflict of interest.

## DATA AVAILABILITY STATEMENT

Research data are not shared due to privacy and ethical restrictions.

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