

## ORIGINAL ARTICLE

# Evaluation of the outcomes of the Quebec provincial suicide prevention gatekeeper training on knowledge, recognition of attitudes, perceived self-efficacy, intention to help, and helping behaviors

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## Abstract

**Introduction:** Gatekeeper (GK) training is a suicide prevention strategy in which community members learn to identify individuals at risk of suicide and refer them for appropriate help. Despite its widespread use, few studies have investigated its effects, including changes in helping behaviors.

**Aims:** To assess the impact of GK training on participants' knowledge, recognition of the influence of attitudes, perceived self-efficacy, intention to help and helping behaviors, and to identify variables associated with GK behaviors.

**Methods:** Mixed linear effects and forward stepwise logistic regressions were used to analyze data from 159 participants receiving the Quebec Provincial GK Training program offered by five different suicide prevention centers using pretest, posttest and 6-month follow-up questionnaires.

**Results:** Participants' knowledge of the GK role and suicide prevention, intention to help, self-efficacy, knowledge of services, and recognition of the influence of attitudes significantly increased following training. Most changes decreased at follow-up but remained higher than at pretest. Lower levels of education and higher intention to help were significant predictors of engaging in helping behaviors in the first 6 months after receiving training.

**Conclusions:** The Quebec GK training appears to be effective in preparing participants for their role but does not appear to significantly increase helping behaviors.

## KEYWORDS

community, gatekeeper training, helping behaviors, risk assessment, suicide prevention

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## INTRODUCTION

Suicide in Quebec is a significant public health issue, with 1055 recorded suicides in 2020 (Levesque & Perron, 2023). Although the suicide rate in Quebec increased steadily until 1999, reaching a rate of 22.1 per 100,000, it has subsequently decreased annually to 11.7 (Levesque et al., 2022). Surveys report that 2.8% of the Quebec population aged 15 and over seriously considered suicide in the last 12 months (Camirand et al., 2016), and 12% considered suicide at least once in their lives (Nanhou et al., 2010); 0.4% reported that they attempted suicide in the past 12 months (Camirand et al., 2016) and 4.4% reported having attempted suicide in their lifetime (Nanhou et al., 2010).

Many risk and protective factors have been studied in suicidology. The involvement of a wide array of biological, psychological, clinical, social, and environmental factors makes the identification of suicidal risk difficult and complex to detect (Turecki et al., 2019). A World Health Organization report (2014) highlighted the unique impact of social, community, and interpersonal factors in preventing suicide. For example, social support (Kleiman & Liu, 2013) and access to health care services (Campo, 2009; Lang, 2013) are significant protective factors. The stigma associated with seeking help has also been identified as a risk factor for suicide (Reynders et al., 2014). These findings have given rise to numerous suicide prevention activities that provide social support, aim to reduce the stigma associated with seeking help, and encourage help seeking, including GK programs.

## GATEKEEPER TRAINING PROGRAMS

GK programs train and support community members to identify individuals at risk of suicide, refer them for appropriate help and encourage them in obtaining the help they need. The duration of GK training ranges from a few hours to several days (Burnette et al., 2015; Roberge & Bouguezour, 2018; Yonemoto et al., 2019). The content of the training varies and is intended to be tailored to the trainee's characteristics and needs. However, some elements are considered essential: addressing personal attitudes towards suicide and their impact on the helping process, developing knowledge and skills in identifying a suicidal person, presenting an effective suicide prevention model, including simulations and observations, and providing information about local resources and how to contact those resources (Isaac et al., 2009). GK programs are inspired by research indicating that individuals at risk of suicide often show visible signs of their distress or mention their problems to their peers, but their peers often do

not recognize these signs and do not refer them for help (Drum et al., 2009; Rallis, 2017).

GK programs are guided by certain theories, most notably Ajzen's theory of planned behavior (Ajzen, 1991, 2011). This theory holds that attitudes (i.e., positive or negative evaluations of performing a particular behavior), subjective norms (i.e., perceived social pressure or influence) and perceived behavioral control (i.e., perceived ease or difficulty in performing the behavior) together shape an individual's behavioral intentions (i.e., readiness and plans to engage in the behavior). In turn, a tenet of this theory is that behavioral intention is the closest determinant of human behavior. These elements are part of the minimal GK training competencies proposed by Hawgood and colleagues (Hawgood, et al., 2022). Guided by a review of existing GK programs, Burnette et al. (2015) proposed a conceptual model that describes the processes associating training and GK helping behaviors. Their model adds individual and environmental factors that can hinder or enhance the effectiveness of these training and helping behaviors. In this model, the target effects of training include knowledge about suicide, beliefs and attitudes about prevention, reluctance/stigma and self-efficacy to intervene.

Several studies have examined the effectiveness of GK training in developing various skills. Although the results are not consistent, there is evidence that GK training may result in both short- and long-term significant increases in objective knowledge, subjective knowledge and norms, positive attitudes towards mental health, help-seeking intervention skills, confidence in one's effectiveness in helping, and intention to help (Burnette et al., 2015; Holmes et al., 2019; Yonemoto et al., 2019). Controlled trials (Teo et al., 2016) and randomized controlled trials (e.g., Coleman et al., 2019; Kuhlman et al., 2020; Sareen et al., 2013; Wyman et al., 2008) have shown that these effects may be attributed to the training. Research to date has been limited to studying the effects of training on knowledge and attitudes. However, little is known about the effects of GK training on helping behaviors (Burnette et al., 2015; Lipson, 2014). Some authors suggest that GK programs increase the identification and referral of at-risk youth (Condrón et al., 2015; Deane et al., 2006; Ewell Foster et al., 2016; Rallis et al., 2018; Wyman et al., 2008), and that the vast majority of youth identified as at-risk would be referred by GKs to appropriate services (Condrón et al., 2015). However, although some studies include pre-post measures of helping behaviors (e.g., Ewell Foster et al., 2016; Tompkins & Witt, 2009), many have only studied the number of helping behaviors reported since training (e.g., Condrón et al., 2015; Deane et al., 2006; Reiff et al., 2019). In the end, literature reviews show strong short-term effects of gatekeeper training on knowledge and self-efficacy, moderate effects on intentions to help and helping behaviors, and

weak effects on improving attitudes, with effects often decreasing after several months (Burnette et al., 2015; Holmes et al., 2019; Shtivelband et al., 2015).

## THE QUEBEC GATEKEEPER TRAINING PROGRAM

The Quebec Gatekeeper Training Program was developed by the Quebec Association for Suicide Prevention (Association québécoise de prévention du suicide; AQPS) in 2008 under contract from the Health Ministry of the Canadian Province of Quebec. Between 2008 and 2019, over 20,000 GKs have been trained throughout the province (Association québécoise de prévention du suicide, 2019). This training was developed for volunteers with no prior intervention background (i.e., natural gatekeepers). The goal is to help them adequately identify at-risk individuals showing signs of suicidal intentions, to refer them for help, and support them in obtaining the help they need. The training is provided by personnel from regional suicide prevention centers (Centre de prévention du suicide; CPS) who were trained and accredited by the AQPS to offer the program, with the possibility of adapting the program to the local context where the training is conducted. The training is standardized and manualized to ensure fidelity (Roy & Beaulieu, 2014). The training is usually provided to several individuals in the same setting (e.g., a school, a workplace) and the GKs are encouraged to create a network of GKs who meets to discuss their GK work. Sometimes, interested organizations contact their local CPS to obtain the training. Other times, the CPS targets organizations based upon analyses of government-provided data on at-risk groups and offers the training. Each GK network has a designated skilled resource person or service to refer people who are identified as needing help, who, whenever possible, works in the same setting (e.g., a school psychologist). In the absence of such professionals, or if the GKs are not trained to be part of a network (independent GKs), the regional CPS is designated as the resource to contact. Also, the CPS will offer to train a resource person in the setting (e.g., the human resources coordinator) with a three-day intervention training program. The role of the designated resource is to receive information from the GK concerning the person identified as being at risk or needing help (if the person agrees). When the person does not take the initiative to contact the resource, the resource person will initiate contact, and offer help. The GK is trained to contact emergency services when there is an imminent risk of an attempt. GKs can share their role and responsibilities in their setting and publicize their role in order to encourage at-risk individuals to initiate contact and approach them

(e.g., in email signatures, written signs on their office door, oral announcements during team meetings).

The Quebec GK training aims at improving participants': (a) knowledge of the GK role and of suicide prevention; (b) knowledge of available services that can provide help; (c) recognition of the influence of personal attitudes in suicide prevention; (d) intention to help and (e) self-efficacy in their role. However, it is unknown which of these skills and areas of knowledge are truly helpful to GKs and positively influence the accomplishment of their role. The Quebec GK training includes eight modules composed of theoretical information, tools and material, practical activities, syntheses, reflective exercises, scientific references, and role plays. In terms of knowledge, the training describes warning signs and trains participants to be able to assess whether someone is at risk of suicide, the urgency of the situation and to determine how to interact with them. Participants are taught about factors that hinder or encourage a request for help and where to refer for help. The training focuses on the attitudes and beliefs that may influence how they will react when confronted with an individual at risk of suicide. The influence of values and beliefs are addressed during the training, and participants are encouraged to reflect on their own, but a change in the attitudes of trained GK is not an objective of the Quebec program (Roy & Beaulieu, 2014), since changes in attitudes may require more extensive interventions and long-term efforts (Holmes et al., 2021). Finally, the program emphasizes that the role of GKs is limited to identifying and referring individuals in distress, not intervening. Because of the COVID-19 pandemic, the seven-hour training was provided both online and in-person by the different CPSs, although both training methods used the same curriculum. The Quebec GK training is standardized but offers training versions specific to some settings/populations (i.e., agricultural settings, elderly, youth) in which the content is modified to present risk factors that are specific to the setting/population, and specialized resources. The trainers also have some flexibility in adapting the training to each setting in their region (e.g., by adding locally pertinent examples, describing local resources). This article reports the results of an assessment of the impact of the Quebec Provincial GK Training Program on participants' knowledge, recognition of the influence of attitudes, perceived self-efficacy, intention to help and helping behaviors, as well as an analysis of variables associated with GK helping behaviors.

The objectives of this study are to:

1. Assess the effects of the GK training on the target outcomes.
2. Determine the contribution of the different variables identified as target outcomes in predicting GK helping behaviors after receiving the training.

## METHOD

### Procedure

Between March 2020 and December 2021, individuals who registered for the GK program with five Quebec regional CPSs were sent an email by the CPS inviting them to participate in the study. This email contained a link to the first questionnaire. They were invited to fill out the questionnaire before their training date and participants completed this questionnaire on average 7.1 days before the training date. Participants were subsequently sent a second questionnaire 7 days after the training, and a third questionnaire 6 months after the training. All participants provided their consent online before accessing the questionnaire and automatically received a copy of the consent form upon completing it. The study received approval from the Research Ethics Board at the Université du Québec à Montréal (certificate No. 3247).

### Participants

Participants had to be at least 18 years old; registered in a GK training provided by a participating CPS and have French language proficiency. The initial sample included 162 participants, but three were excluded due to having completed the first questionnaire after their training, resulting in a final sample of 159. Participants were mostly female (74.2%), married or cohabiting (66.5%) and with a college or university degree (50.9%). They were on average 40.4 years old (Table 1). Consistent with the Quebec GK program implementation, participants came from a wide range of settings (small business to governmental agency, middle school to large university, agricultural setting to city hospital, etc.) and occupied very different roles (administration, management, teaching, trade work, care, etc.).

### Measures

#### Instruments

To develop sensitive measures adapted to the Quebec training, GKs and professionals involved in the Quebec GK program were consulted: a GK trainer and a trainer-advisor from a CPS, the training coordinator from the AQPS, a scientific advisor from the Quebec National Institute of Public Health, and two trained GKs. Informal interviews were conducted to schematize the program's logic model. Target outcomes of the training were identified based on the scientific literature, the program's framework (Roy, 2005, 2006), and experiential input

TABLE 1 Characteristics of participants.

Demographic variables	Frequency (%)
Age ([Range]; M; SD)	([18–70]; 40.4; 12.6)
Gender	
Male	41 (25.8)
Female	118 (74.2)
Marital status*	
Single	45 (28.5)
Married or cohabiting	105 (66.5)
Separated/divorced/widowed	8 (5.1)
Education	
High school	14 (8.8)
Trade school	15 (9.4)
Junior College (CEGEP)	49 (30.8)
College/University	81 (50.9)
Expected gatekeeper type*	
In a network	104 (68.9)
Independent	47 (31.1)
Setting	
Workplace	40 (25.2)
School	48 (30.2)
Community	17 (10.7)
Health and social services	12 (7.5)
Agricultural	15 (9.4)
No setting	27 (17.0)
Had contact with at-risk individual over lifetime	
Yes	110 (69.2)
No	49 (30.8)

Note: \*Some data on marital status ( $n=1$ ) and gatekeeper type ( $n=8$ ) are missing. Gatekeeper type presented here was assessed before training at pretest but was also assessed after training at posttest.

before instruments were selected to assess each of the training's desired effects. The logic model proposed was a modified version of Burnette et al. (2015), in which the training increased the different target outcomes, which would in turn increase helping behavior. Intention to help was included with other target outcomes but suggested to be a potential mediator by the literature (e.g., Ajzen, 1991, 2011; Kuhlman et al., 2017). The questionnaire was then sent to all the interviewees for comments and suggestions. All instruments were developed in French and put on the Qualtrics XM online survey platform (Qualtrics, Provo, UT) with a missing item response reminder activated to avoid possible missing data. All instruments were administered at the three timepoints, except sociodemographic items (pretest only) and the helping behavior measure (pretest and follow-up only). Training format (online or in-person) was specified at posttest.

### *Sociodemographic variables and general information*

The pretest questionnaire included sociodemographic items: gender, age, marital status, education, occupation, and the first three characters of their postal code. We asked about lifetime contacts with individuals at risk of suicide. There were also items concerning their GK training: the name of the organization dispensing the training, and the setting in which participants were to be trained (school, workplace, community, health and social services organization, agricultural, recreational, other, none in particular). These categories were used by relevant stakeholders (AQPS, CPS) in Quebec and considered to be an adequate way to classify them (see Roberge & Bouguezour, 2018). Finally, participants were asked whether they were being trained to be part of a GK network.

### *Knowledge of gatekeeper role and suicide prevention*

Knowledge of gatekeeper role and suicide prevention was measured with a 12-item questionnaire created by the researchers and adapted from a revised French version (Lapierre & Béland, 2009) of the Questionnaire on Objective Knowledge (Tierney, 1988). This questionnaire was modified following suggestions from professionals and the GKs consulted. Most changes were in the original language used, which was considered to be too intervention oriented. Questions on subjects that were not addressed in the Quebec training were eliminated. Each question was followed by four multiple choice answers. A participant's score was the number of correct answers, with scores ranging from 0 to 12. In the present study, Cronbach alpha coefficients at pretest, posttest and follow-up were 0.52, 0.46, and 0.36, respectively.<sup>i</sup>

### *Recognition of the influence of attitudes in suicide prevention*

Based on the Quebec program's objectives (Roy, 2005, 2006), attitudes towards suicide and suicide prevention, which are usually used in GK programs evaluations, were replaced by awareness of the influence of one's own attitudes concerning suicide, assessed by two Likert scale questions (*strongly disagree, disagree, neutral, agree, and strongly agree*), used to calculate a score from 0 to 6: "Someone's reaction to a suicidal person is influenced by some of their beliefs and prejudices" and "My reaction to someone who is suicidal is influenced by some of my beliefs and prejudices."

### *Intention to help*

Intention to help was measured by the two questions from the Intention to help subscale of the Gatekeeper Behavior Scale (Albright et al., 2016), which assessed their likelihood to discuss suicide and recommend resources. The two items were answered on a Likert scale with four possible answers (*very unlikely to very likely*), with scores from 0 to 6.

### *Perceived self-efficacy*

Self-efficacy was assessed using a 9-item questionnaire developed for the AQPS (Roy & Beaulieu, 2014), which is used to assess perceived self-efficacy before and after the training. Respondents rated their agreement (*strongly disagree, disagree, agree, strongly agree*) that they felt able to accomplish each of the components (i.e., identify someone vulnerable to suicide, foster help-seeking, initiate contact with an at-risk person appropriately). Items were answered on a four-point Likert scale (*strongly disagree to strongly agree*), for a total score from 0 to 27. Alpha coefficients at pretest, posttest, and follow-up were 0.90, 0.87, and 0.94, respectively.

### *Knowledge of help services*

Knowledge of help services was assessed with the open-ended question: "What resources and support services do you know of to which you could refer a person vulnerable to suicide? Name them." Responses were quantified with participants' scores consisting of the number of appropriate services participants could name (services or professionals providing support for at-risk individuals).

### *Helping behaviors*

Helping behaviors were assessed during pretest and follow-up by calculating the sum of two behaviors: (1) identification involving recognizing that an individual might be at risk; and (2) approach, which consists of being approached for help by an at-risk individual (Ewell Foster et al., 2016).

Participants were asked to state the number of people in the past 6 months who had approached them for help, and the number of people with signs of distress or suicidal risk they had themselves identified. The total number of helping behaviors was then calculated for each participant. For each individual helped (identified or approached), participants provided anonymous estimations of sociodemographic characteristics (i.e., age range, gender), risk factors identified (e.g., social exclusion, substance use), situation of the person (e.g., divorce, loss), relationship with the person (e.g., neighbor, coworker, family member), if they were approached or initiated contact, whether a reference was provided and to whom/which service, and their satisfaction with their interaction (very satisfied to very dissatisfied [1–5]).

## Analyses

All analyses were conducted with R (Version 4.0.3; R Core Team, 2020) in RStudio (RStudio Team, 2020). Descriptive analyses were used to examine participants' sociodemographic characteristics and individual-level factors, as

well as target outcomes (knowledge of GK role and suicide prevention, recognition of the influence of attitudes on suicide prevention, intention to help, perceived self-efficacy, and knowledge of help services), and helping behaviors. Comparative analyses (Chi-squared tests of independence, Fisher's exact test, and independent samples *t* tests) were used to assess differences between participants who had completed all three measures and those who did not.

First, an exact Wilcoxon signed-rank test was conducted with a reduced sample of participants who had completed all three time points, to examine the impact of GK training on helping behaviors 6 months before (pretest) and 6 months following training (follow-up). A linear mixed effect model was conducted on target outcomes to assess change over time (package *lmer*). Effect size was calculated following Westfall et al. (2014). Due to missing data and non-significant differences between online and in-person scores, training format was not included in the analysis. Post hoc tests were conducted to determine differences between specific time points when significant differences were found. Multivariate forward stepwise logistic regression models were used to determine the contribution of independent variables in predicting GK helping behavior at pretest and follow-up. In these regression models, sociodemographic variables and target outcomes (model 1 = pretest, model 2 = follow-up) were entered. All statistical tests were two-tailed; *p* values <0.05 and 95% confidence intervals were considered statistically significant.

## RESULTS

### Sample

The final sample was composed of 159 participants. Seventy-eight participants (online training *n* = 53, in person training *n* = 25) completed the questionnaire at all three time points (attrition rate 50.9%). However, 28 of the 81 participants who abandoned the study ended up not receiving the training and could not continue their participation, thus there was attrition of 53 out of the 131 possible participants (40.5%). There was only one missing datum (one participant did not provide their highest diploma). The participant was listwise deleted in the regression analyses. An independent-samples *t* test showed a significant age difference,  $t(157) = 3.34$ ,  $p = 0.001$ , between the participants who received the training and completed all questionnaires ( $M = 43.7$ ,  $SD = 13.4$ ) and those who did not ( $M = 37.2$ ,  $SD = 11.3$ ). There were no other significant differences in sociodemographic variables (gender, marital status, education, lifetime experience with at-risk individuals), training format, and pretest measures of outcome variables (Table 1).

### Effects of gatekeeper training on target variables

Mixed model analysis (Table 2) revealed a significant time difference for all desired outcomes; knowledge of suicide prevention, self-efficacy, intention to help, knowledge of help services, and recognition of attitudes. Post hoc testing revealed significant differences between pretest and posttest for all target outcomes, indicating an increase in scores following training. At the 6-month follow-up, there was no significant difference for intention to help, recognition of attitudes and knowledge of help services when compared to posttest, suggesting that increases were maintained over time. There was a significant difference between posttest and follow-up for knowledge of suicide prevention and self-efficacy, suggesting that these scores decreased over time. Post hoc testing revealed significant differences between pretest and follow-up for knowledge of suicide prevention, intention to help and recognition of attitudes, suggesting that scores remained higher than before training. Post hoc testing also showed non-significant differences between pretest and follow-up for knowledge of services and recognition of attitudes (Figure 1). Services named by participants consisted of a few local professionals and resources (e.g., school psychologists, student services), and mostly regional institutions (CPS, hospitals, crisis centers, community organizations), and national services (911, helplines). Few services and resources named offered help for issues other than suicide, mental health, and general psychosocial support. Participants from the most rural CPS named fewer resources than others at the three different timepoints.

Twenty eight percent of participants in work settings reported at least one helping behavior 6 months before the training ( $M = 0.28$  [0–1]) and 20% reported at least one in the first 6 months after the training ( $M = 0.36$  [0–4]). In school settings, 30% reported helping behaviors before ( $M = 0.40$  [0–2]) and 45% after training ( $M = 0.65$  [0–4]); in community settings there were 44.4% before ( $M = 1.0$  [0–4]) and 44.4% after ( $M = 0.66$  [0–2]); in health and social services settings there were 20% before ( $M = 0.20$  [0–1]) and 20% after ( $M = 0.20$  [0–1]); 14.3% before ( $M = 0.25$  [0–1]) and 0% and after ( $M = 0$  [0]) in agricultural settings; and 36.4% before ( $M = 0.45$  [0–2]) and 36.4% after ( $M = 0.64$  [0–2]) when the GK did not report being trained in any particular setting. Overall, before training, 81.3% (13/16) of participants approached at-risk individuals and after training, they approached 93.8% (15/16). Participants provided referrals for 75% of individuals helped before training and 87.9% of those helped after training. A Wilcoxon signed-rank test pre-post indicated that the training was not associated with a significant change in helping behaviors reported by participants in

TABLE 2 Estimated marginal mean scores for target outcomes at each time point ( $n=159$ ).

	Main effect of time— $F$ (df)	$M$	95% CI	$p$	Cohen's $d$
Knowledge of Suicide Prevention	95.415 (2, 211.3)	[0–12]		$p < 0.001$	
Pretest		8.39	8.12–8.66	Pretest vs. Posttest = $p < 0.001$	1.207
Posttest		10.50	10.19–10.82	Posttest vs. Follow-up = $p < 0.001$	0.257
Follow-up		10.05	9.70–10.40	Follow-up vs. Pretest = $p = 0.045$	0.947
Self-Efficacy	84.073 (2, 220.60)	[0–27]		$p < 0.001$	
Pretest		16.66	15.95–17.38	Pretest vs. Posttest = $p < 0.001$	1.378
Posttest		22.97	22.12–23.83	Posttest vs. Follow-up = $p < 0.001$	0.367
Follow-up		21.29	20.32–22.26	Follow-up vs. Pretest = $p = 0.014$	1.011
Intention to Help	8.366 (2, 235.31)	[0–6]		$p < 0.001$	
Pretest		4.70	4.52–4.89	Pretest vs. Posttest = $p = 0.001$	0.393
Posttest		5.16	4.95–5.38	Posttest vs. Follow-up = $p = 0.006$	0.022
Follow-up		5.14	4.90–5.38	Follow-up vs. Pretest = $p = 0.984$	0.371
Knowledge of Services	6.394 (2, 226.45)			$p = 0.002$	
Pretest		2.45	2.20–2.71	Pretest vs. Posttest = $p = 0.001$	0.360
Posttest		3.05	2.74–3.35	Posttest vs. Follow-up = $p = 0.205$	0.257
Follow-up		2.76	2.43–3.09	Follow-up vs. Pretest = $p = 0.319$	0.950
Recognition of Attitudes	8.453 (2, 229.80)	[0–6]		$p < 0.001$	
Pretest		3.70	3.47–3.94	Pretest vs. Posttest = $p < 0.001$	0.430
Posttest		4.36	4.08–4.64	Posttest vs. Follow-up = $p = 0.460$	0.273
Follow-up		3.94	3.63–4.26	Follow-up vs. Pretest = $p = 0.079$	0.157

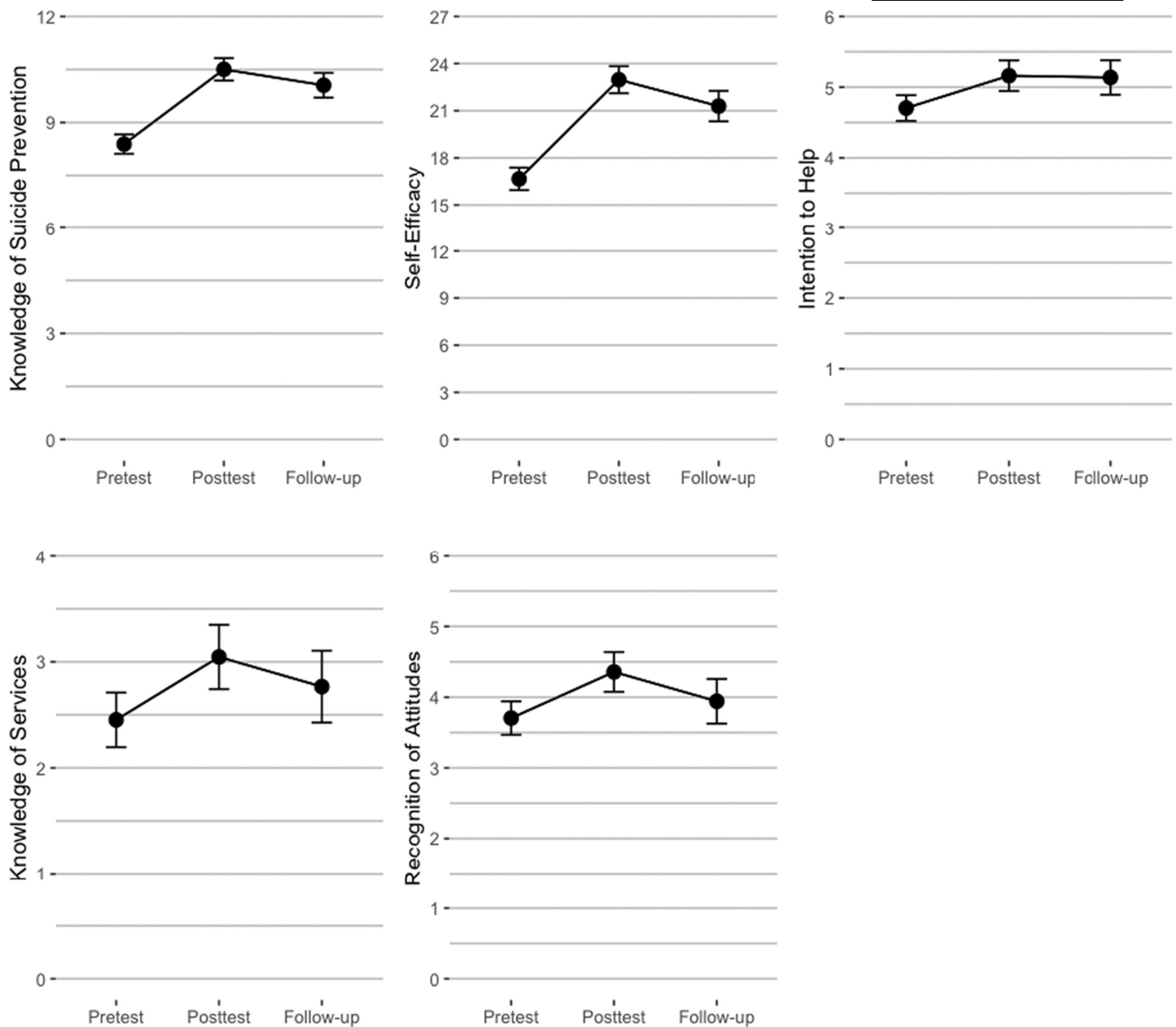


FIGURE 1 Estimated marginal mean scores with 95% CI of target outcomes at pretest, posttest and 6-months follow-up after GK training ( $n=159$ ).

TABLE 3 Mean number of distressed or at-risk persons whom participants ( $n=78$ ) helped in the 6 months before and after training.

	Pretest		Follow-up	
	<i>n</i>	<i>M</i> (SD)	<i>n</i>	<i>M</i> (SD)
Distressed or at-risk people identified by participants in the past 6 months	17	0.22 (0.45)	16	0.21 (0.44)
Distressed or at-risk people who approached participants in the past 6 months	15	0.19 (0.43)	20	0.26 (0.57)
Total helping behaviors	32	0.41 (0.75)	36	0.46 (0.86)

the first 6 months after the training ( $Z=-0.53$ , n.s.), with a median number of helping behaviors of 0 in both pretest and follow-up (Table 3). The subset of the 23 participants with helping behaviors at pretest ( $n=32$ ,  $M=1.39$ ,  $SD=0.72$ ), was responsible for a large part of the helping

behaviors at follow-up ( $n=25$ ,  $M=1.09$ ,  $SD=1.28$ ), and the 55 individuals who reported no helping behavior at pretest were responsible for a small part of the helping behaviors at follow-up ( $n=11$ ,  $M=0.2$ ,  $SD=0.40$ ). Mean scores of satisfaction with interactions in the 6 months



was 3.70 (SD=0.73) before training and 3.43 (SD=1.17) after training.

## Predictors of helping behaviors

Exploratory forward stepwise logistic regression analyses were conducted on the pretest ( $n=159$ ) and follow-up ( $n=78$ ) data to identify the variables associated with helping behaviors. Variables entered included target outcomes (knowledge of the GK role and suicide prevention, self-efficacy, intention to help, knowledge of help services, and recognition of the influence of their attitudes in suicide prevention), sociodemographic characteristics (age, gender, education, marital status), and setting type. Regression diagnostics showed that statistical assumptions of linearity and influential values were respected and that there was no issue of multicollinearity, with a variance inflation factor less than 2 for all variables. The first model (pretest) was significant ( $X^2(7)=18.26$ ,  $p=0.01$ ) and accounted for 16% of the variance (Nagelkerke  $R^2=0.16$ ) in engaging in help-behaviors (Table 4). Within this model, no variable was a significant predictor of helping behaviors. The second model (follow-up) was significant ( $X^2(7)=25.10$ ,  $p=0.001$ ) and accounted for 37% of the variance (Nagelkerke  $R^2=0.37$ ) in engaging in helping behaviors. In this model, education was negatively associated with helping behaviors: for each increase in education level, the odds of engaging in helping behaviors decreased by 73.3%. Intention to help was positively associated with helping behaviors, where each increase of 1 point in intention to help was associated with an increase of 217.2% in the odds of engaging in helping behaviors.

## DISCUSSION

The results indicate that participation in the Quebec GK training was associated with significant pre- to post-training increases in participants' knowledge of the GK role and suicide prevention, self-efficacy, intention to help, knowledge of help services, and recognition of the influence of their attitudes in suicide prevention. This is in line

with previous studies reporting increased knowledge of suicide prevention and available help services, improved attitudes, and skills following GK training (Burnette et al., 2015; Herron et al., 2016; Holmes et al., 2019; Isaac et al., 2009; Jacobson et al., 2012; Lipson, 2014; Nasir et al., 2016). However, most of the increases in scores were not sustained at follow-up 6 months later, although the scores remained somewhat higher than before training.

Increases in knowledge of the GK role and suicide prevention, and self-efficacy have both been associated with higher motivation and participation in suicide prevention activities (Burnette et al., 2015; Isaac et al., 2009). We found that scores increased after training but somewhat decreased in follow-up, although remaining higher than before training, which concurs with results from several prior studies (Holmes et al., 2019). It has been proposed that the lack of opportunities to engage in helping behaviors may explain a decrease in perceived efficacy and declarative knowledge over time (Hawgood et al., 2020). Several CPS in Quebec offer booster trainings to consolidate skills and knowledge, in response to feedback from trained GKs who said that additional training is necessary (Roberge & Bouguezour, 2018) and similar suggestions from several authors (Cimini et al., 2014; Cross et al., 2011; Keller et al., 2009; Zinzow et al., 2020). In our sample, almost none GKs had already received such training at the 6-month follow-up, but 66% of Quebec GKs who had been trained for more than a year reported receiving follow-up training (Roberge & Bouguezour, 2018). Further studies should include additional follow-up measures and include assessments of the impact of booster training in their statistical models.

The significant increase we reported in the recognition of attitudes differs from Holmes et al.'s (2019) findings that most GK studies they reviewed only showed a weak short-term benefit in improving attitudes following GK training. It has even been proposed that trying to change attitudes in volunteer GKs may be unproductive (e.g., Coppens et al., 2014). In our study, we assessed recognition of the role of attitudes, rather than changes in participants' attitudes, adapting Ajzen's theory of planned behaviors and its focus on changing attitudes towards behavior. Perhaps future training may benefit from focusing

**TABLE 4** Stepwise logistic regressions with helping behavior as the dependent variable at pretest ( $n=158$ ) and follow-up ( $n=77$ ).

Timepoint	Model	Independent	$\beta$	SE $\beta$	OR (95% CI)	$p$
Pretest	Model $X^2=18.26$ ( $p=0.01$ ) $R^2=0.16$					
Follow-up	Model $X^2=25.54$ ( $p=0.001$ ) $R^2=0.37$	Education	-1.32	0.48	0.27 (0.11, 0.68)	0.006
		Intention to help	1.15	0.40	3.17 (1.48, 6.97)	0.004

on the recognition of the role of attitudes, as a potentially important preliminary step in the process of changing one's own attitudes.

Knowledge of a variety of help services is an essential target outcome of some GK training program (i.e., suicide prevention, substance abuse, gambling, domestic violence, etc.) in order to increase a GK's options in making referrals. As part of the Quebec GK training, referrals to support services and resources are supposed to be provided to individuals who are not assessed as being at risk for suicide, but GKs are expected to refer at-risk participants to their designated resource. Our results show a high variability in the number of resources named by participants and a posttest increase that was somewhat maintained at follow-up. It is important to note that the number of available resources is largely dependent on the setting, and knowledge of the generally limited number of resources available locally is not expected to change dramatically following the training. In fact, most of the resources named by participants were the regional CPS and/or a designated resource inside the setting. However, in the past, trained GKs have expressed a need to receive information about available resources for distressed individuals, as well as having access to tools such as resource directories (Roberge & Bouguezour, 2018). In the context of Quebec's GK training, it may be worth considering whether efforts to increase knowledge of non-suicide-related help resources are warranted.

Interestingly, we found no difference in helping behaviors 6 months before and 6 months after the training, which is what was observed in some previous studies (Sareen et al., 2013; Tompkins & Witt, 2009), but not others where increases were observed (Lancaster et al., 2014; Rallis et al., 2018). It is possible that training has a small effect on helping behaviors that was not detected in this sample. It is also possible that individuals volunteering to participate in the program (and in the current study) were already highly motivated to engage in helping behaviors, as shown by the high pretest scores in intention to help and the increases in the other variables after training, which were somewhat maintained 6 months later. Since a high proportion of participants were in at-risk settings or were already in contact with at-risk individuals, participating in a GK training may not significantly change the number of individuals with whom participants engage. This is supported by the somewhat high number of helping behaviors reported by natural GKs over a 6-month period, with almost one helping behavior for every two GKs, both before and after training. Our findings also show that a small subset of gatekeepers was responsible for the majority of helping behaviors reported before and after training, suggesting unequal opportunities or motivation to engage with at-risk individuals. Although this small sample was

not tested statistically, the scores for satisfaction with interactions were slightly lower and more variable in the 6 months after training compared to the 6 months before training, suggesting a more complex relationship between training and helping behaviors. However, the training may still improve the quality of their interactions with the people they contact. This needs to be verified in future research.

Prior evaluations of GK training reported that some individual and sociodemographic characteristics may influence the acquisition of skills (Condrón et al., 2019; Rallis et al., 2018), but few have reported an association between sociodemographic variables and helping behaviors. Our regression models showed no significant predictors of helping behaviors before training, but level of education was negatively associated with the likelihood of having engaged in helping behaviors in the first 6 months after receiving the training, with no other association between sociodemographic factors and helping behaviors. Although some studies have found that educational background and job type impacted help-behaviors following training (Wyman et al., 2008), our study is the first to suggest that education may be associated with helping behaviors, prompting the need for further research on predictors of gatekeeper behaviors. Since participants in the current study came from a variety of different settings, it was not possible to categorize the different job types and educational backgrounds, which could be the source of a confounding bias. The setting is an influential factor in helping behaviors and context should be taken into consideration. Moreover, we found that knowledge of the GK role and suicide prevention, knowledge of services, self-efficacy, and recognition of attitudes did not predict helping behaviors. This corroborates findings by Tompkins and Witt (2009), who found that changes in knowledge and self-efficacy did not translate into behavior changes in the enactment of key GK behaviors. One target outcome, intention to help, was a significant predictor of helping behaviors at follow-up. These results are consistent with GK research conceptualizing an individual's self-reported likelihood of engaging in behaviors as an indication of their probability of taking action (Albright et al., 2016). Since an individual's self-reported likelihood of engaging in a behavior acts as a good predictor of such behavior, it may be useful to adapt currently used instruments assessing behavioral intent to reflect intrinsic motivation more directly.

## LIMITATIONS

The small sample, attrition and lack of a control group limit the ability to determine if observed changes over time

are specifically associated with participation in the GK training. Some statistical tests used, such as the Wilcoxon signed-rank test, are underpowered in small samples. These limitations are found in much of the literature on GK program evaluations, with large attrition rates of 72%, 74%, 76%, 96%, and 96% found in Zinzow et al. (2020), Holmes et al. (2021), Kuhlman et al. (2020), Hawgood et al. (2020), and Smith-Millman et al. (2022), respectively. It is possible that other experiences during that time influenced the target outcomes. However, we are not aware of any activities during this period of time that could have resulted in changes in the target variables. One possibility may be the context of the COVID-19 pandemic, which occurred during this study. Due to increased population distress and demands on communities, workplaces, and health services, GKs may have engaged in more helping behaviors prior to receiving the training, than in a non-pandemic context. However, since a large proportion of the Quebec population worked from home, GKs should have had fewer opportunities to meet people and more difficulty interacting with those at-risk, which would have resulted in fewer contacts. Further studies may gain from considering contextual factors in assessing helping behaviors.

Some of the instruments used in this study were adapted by the authors and the adapted versions have not yet been validated. The reliability of several measures poses a challenge due to consisting of only two items. Moreover, the researchers' inability to examine the quality and accessibility of services named by participants is a limit of the instrument used. Finally, there is a potential retrospective recall bias involved in the helping behavior measure. Nevertheless, it is essential to adjust instruments to the logic model of the specific program being evaluated (Brousselle & Champagne, 2011) and the cultural context in which it is deployed (Bravo, 2003; Canino et al., 1997). However, comparing results with other GK evaluations should be considered in the context of these adaptations. The potential adaptations of the training to the contexts could theoretically be considered to complexify the evaluation of its effectiveness, but the modifications of adapting examples and discussions of available resources to the context did not impact the essence of the training activities.

Also, the sample of participants who agreed to participate in the study did not constitute a randomized sample of all people who participate in GK trainings, which is a difficulty present in all studies where participation is voluntary. Our participants may have had a higher level of motivation than non-participants, which could have been reflected in their high pretest scores on intention to help.

## CONCLUSION

Few studies have investigated the impact of GK training programs on helping behaviors. Our study found that participating in the Quebec GK training increased knowledge of the GK role and suicide prevention, self-efficacy, recognition of the influence of attitudes in suicide prevention, knowledge of resources, and intention to help from pre- to post-training. Furthermore, these increases were somewhat sustained 6 months later. However, we did not find an increase in engaging in helping behaviors from pre-training to follow-up. More research is needed to better understand how GK training may facilitate increases in helping behaviors, and whether GK training improves the quality of help provided by people who had already been providing help before receiving the training. Larger studies with control groups would help identify the effects associated with the Quebec GK training. Further research is also needed to understand the environmental and organizational factors associated with GKs engaging in helping behaviors in different settings.

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## CONFLICT OF INTEREST STATEMENT

The authors have no conflict of interest to declare.

## DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available due to privacy or ethical reasons.

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## ENDNOTE

<sup>i</sup>The low alpha coefficient for the knowledge items may be explained by the fact that different domains are assessed by the knowledge questions, so individuals could be expected to have different levels of knowledge in different domains.

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