

A Systematic Review of Early Intervention for Suicide Prevention among College Students

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Abstract: *Suicide is a worrying health problem with a high prevalence among students. An effective and efficient program in preventing suicide is needed for campus environments. This research investigated various forms of suicide prevention programs and identified the most effective and efficient interventions. The databases were Scopus, Proquest, Pubmed, Cinahl, and SagePub using keywords consisting of “intervention”, “suicide” and “college student”. This systematic review used Item Reporting Approach for Systematic Review and Meta-Analysis (PRISMA) to analyze 15 articles extracted from databases using specific criteria. The interventions to reduce the risk of suicide among student were peers’ willingness to intervene, positive thinking and social support, affirmation, spiritual motivation, web-based videos, online screening and counseling, online mental health assistance, surveys web-based personal experiences, Question-Persuade-Refer (QPR) training with Gatekeepers, dialectic group skills training and group cognitive therapy, and social norm campaigns. There are advantages and disadvantages of suicide interventions concerning student compliance, faculty staff involvement, a small number of subjects and social stigma about mental illness. Web-based or online interventions posed more advantages, especially about the social stigma. Web-based or online interventions were the most preferred interventions among students because they had a lower chance of creating a negative stigma.*

Keywords: *Intervention; Prevention; Suicide; College Students.*

I. INTRODUCTION

College students are important to consider because their roles are awaited by the community; as in addition to being educated, they can also provide social change for a better life and give an important contribution to the country [1]. Physical, as well as psychological well-being among the students is important. College staff must seriously care about this condition to prevent an increase in the incidence of suicide cases among college students. Nowadays, research [2] explains that there were many various treatment suicides, rather than other mental disorders.

Suicide emerged as a significant psychological health problem because it ranked the second highest cause of death. WHO (2017) recorded that 20% of people who committed suicide were in the age range of 15-29 years [3]. A research [4] stated that 35% of US College students reported depressive feelings and learning difficulties. And the other 50% reported extreme anxiety which made it difficult for them to succeed academically. The Center for Collegiate Mental Health (CCMH), an organization which collects data on mental health and counseling or mental health centers from more than 263 universities, found that almost 33% of students had come with serious mental health problems and even with the idea and attempt to suicide at some point in their life.

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A research [5] explained that suicide data is needed for effective suicide prevention programs in college. There are various interventions to prevent suicide, such as Dialectical Behavior Therapy Skills Training Group (DBTSTG), Cognitive Therapy Group (CTG), School-based Education Interventions, Staff's Screening Simulation Training, positive thinking and social support, QPR Training, Kognito Training, online interventions for college students at risk for suicide, coping experience, online help, web-based self-awareness, online counseling, and online screening for students.

However, there were advantages and disadvantages but it was difficult to apply all of those interventions. An intervention able to minimize social stigma and student compliance should be web-based suicide prevention. Nevertheless, more analysis is required to compare the web-based method with the others according to the student's quality of life including mental health conditions and academic performance. Thus, this systematic review aimed to analyze various suicide prevention modalities to further identify the most effective and efficient one for preventing suicide among college students.

II. METHODS

The authors performed electronic database search, study selection, data extraction, and a systematic literature search on studies published in the last five years (published in 2014-2019) through several online databases Full-Text: Scopus, Proquest, Pubmed, Sagepub, Cinahl, and Sagepub. We limited the search by using the keywords "intervention", "suicide" and "college student". All the selected studies had to be published in English. Other languages would be excluded from this study.

- Criteria

The author searched the studies from the databases and pooled them and checked the duplication. The studies included had to be written in English. The inclusion criteria were quantitative researches about suicide prevention to college students. The exclusion criteria were the researches carried out on teenagers, young adults in high school, children, elderly, community, qualitative research, and systematic reviews.

- Data extraction

The data extraction was carried out by the first reviewer and checked by the second reviewer. The authors used a standardized form to extract data independently and selected 15 relevant studies that fulfilled the criteria of this study.

Picture 1 shows the search results and study selection according to the PRISMA guidelines (Liberati et al., 2009). The author used keywords for the databases which resulted in 107 studies from Scopus of which 8 were appropriate and met the eligibility criteria, 157 journals from which 2 were chosen, a journal from Proquest, a journal from SagePub, and 110 studies from Cinahl 110 from which 3 journals were included. Thus, the author selected a total of 15 journals to be analyzed in this systematic review.

The intervention given in the literature review came in various types, among others; DBTSTG, CTG, School-based Education Interventions, QPR Training, Kognito Training, Staff's Screening Simulation Training, positive thinking and social support, online interventions for college students at risk for suicide, coping experience, online help, web-based self-awareness, online counseling, and online screening for students.

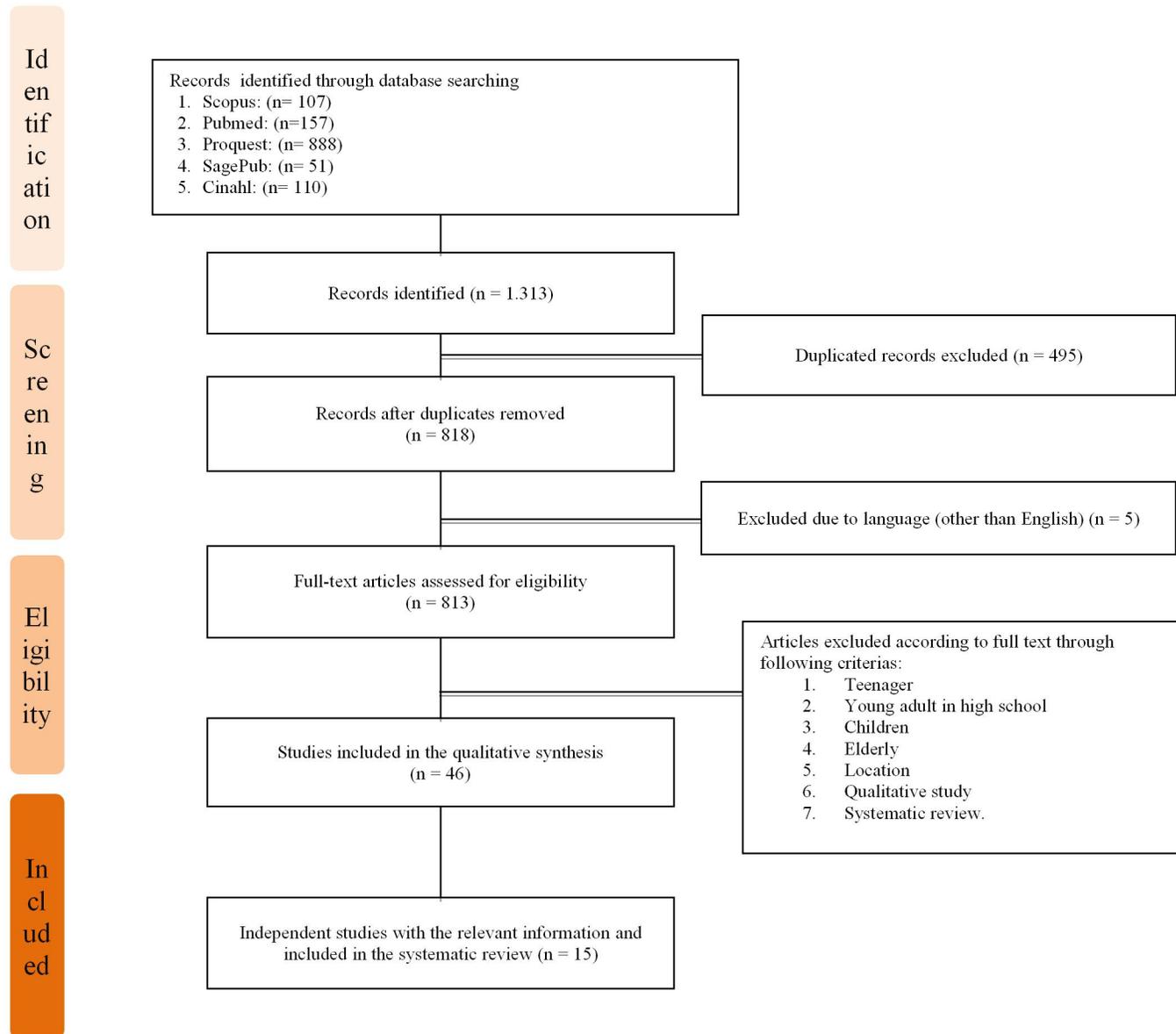


Figure 1. Study Selection using PRISMA

III. RESULT

The studies were published between 2014 and 2019. The researches took place in various countries with numerous methods. The methods used in the journals were Randomized Controlled Trial (RCT), quasi-experimental, experimental, pre-experimental, and cross-sectional online survey. The mostly used research design was the cross-sectional, while the highest number of samples involved 2.727 respondents and the lowest 51.

1. This research of suicide prevention online by providing a Kognito's Avatar-Based training program [6], which explained that all the modules, gave significant benefits in readiness, likelihood, and self-efficacy of intervention in assisting problematic college students. Kognito training was effective on a large scale in educating users to act as facilitators for college students at risk of suicide.
2. The study of suicide prevention by providing Dialectical Behavior Therapy Group vs Cognitive Therapy Group training program.[7], explained that Cognitive Therapy Group (CTG) showed improvements in positive errors, but the DBTSTG revealed increases in acceptance and decreases in suppression scores.

3. The research about seeking online assistance for college students with suicidal ideas [8], which showed that suicide ideas were positively correlated with intention to seek online help with significant relief results $r= 0.35$, 95% CI bootstrap (0.252, 0.295), and online help preference $r= 0.22$, 95% CI bootstrap (0.149, 0.295).
4. The anonymous online survey research about the experience of suicidal intention and the use of various clinical services, community support, and self-care strategies which were posted on websites and other outlets by [9] described that peer support interventions, emergency rooms and clinics' crisis phone were used less frequently. The most-used strategies were self-care strategies, including engaging in social activities, using positive affirmations, exercise, and spiritual practice.
5. Two studies [10] and [11] explained that to measure suicide risk, the specific measurement instrument for suicidal risk, which was widely used, was called The Suicide Behaviors Questionnaire-Revised (SBQ-R) owned by Osman, Bage, & Guetierrez, (2001) [12]
6. The research provided online intervention and screening [13], and the results showed the students who had positive suicide risk were screened during implementation. They had significantly higher readiness for aid scores, and preferred online screening due to lower stigma levels.
7. The intervention study of mediating the effects of positive thinking and social support [14] had a direct effect on resilience and reduced risk of suicide ($p < 0.01$).
8. The suicide prevention study with suicide facts and the stigma associated with receiving treatment for suicidal thoughts [15] showed higher knowledge and lower stigma.
9. The research of adaptive treatment strategies [16] showed lower dropout treatment rates. Treatment satisfaction among clients and counselors is high.
10. The training study on campus staff [17] showed a significant effect in responding to suicide treatment.
11. The web-based suicide awareness program study [18] explained that culturally relevant results would be a very appropriate and effective strategy to promote early detection of suicidal behavior and help-seeking behavior among college students. Disseminating suicide awareness videos using web-based technology was a feasible approach to self-awareness and prevention for college students.
12. The study of gatekeeper training programs by using questions, persuasion, referral (QPR) [19] showed significantly improved attitudes, subjective norms, and perceived behavioral control regarding suicide interventions, and intentions to intervene in the college community.
13. The research on social norms of suicide prevention campaigns and the search for assistance by UCC [20] explained that whatever the conditions, students who saw the message reported greater effects than those who did not see it.
14. The suicide intervention research by involving peers' willingness; college students' intentions to intervened [21] specifically described attitudes ($\beta = .09$, $p < .01$), subjective norms ($\beta = .19$, $p < .001$), and PBC ($\beta = .49$, $p < .001$) in which all significantly predicted intention to help intervene.

Some interventions were found to provide significant benefits to respondents with suicide risk, but some interventions were of great interest to respondents because they reduced stigma, such as online counseling, online training, early detection, online screening and online mental health assistance. Five studies are evaluating online-based interventions, so the researcher was interested to research by using a combination of suicide risk prevention intervention in college students which was a web-based solution to reduce suicide risk in which there was counseling and displaying positive thinking interventions, spiritual motivation and web-based affirmations.

IV. DISCUSSION

This systematic review synthesized published literature correlated with suicide prevention among students in 15 literature studies. Five studies used online by web-based interventions, while the other 10 traditionally had direct meetings with respondents either by given training or identification.

The following are some of the advantages and disadvantages of suicide risk prevention interventions found in 15 literature studies: training studies which involved campus staff [14] have the advantage of being friendly with the

involvement of campus staff as the first line of defense which create a safer campus and provide immediate help for students who are at risk of suicide. The drawback is they need the design of the stages with additional data collection because there is evidence of training experiencing degradation in suicidal prevention knowledge over time. The Dialectical Behavior Therapy Group versus the Cognitive Therapy Group [19] training program has as shortcomings the inability to explain the effects of expectations, emotional regulation strategies as measured by self-reports and is unknown if the strategies are actually applied by participants. Intervention studies of the effect of mediating positive thinking and social support [11] have the advantage of being the first study to examine the mediating effects of positive thinking and social support on self-esteem and suicide endurance in students, ultimately resulting in increased endurance and reducing suicide in college students. The weakness of this study is that the data was collected from one university and did not represent all the students because the sample was randomized but the participants who took part were too few, only 131 research subjects participated from the invited 360 subjects.

Ten studies were manually or traditionally done and had a lack of samples. This intervention also had a higher stigma so that respondents were unwilling and less open. This condition can interfere with the response. Among the ten manual studies, two studies used interventions that provided training for students to intervene by giving help to friends. Moreover, two studies used intervention counseling facilities, two provided knowledge about the signs of suicide, one provided positive thinking, and social mediation intervention support, and two studies conducted a screening. One study provided training interventions in Dialectical Behavior Therapy Skills Group versus the Cognitive Therapy Group.

Five web-based/online intervention studies have the disadvantages of not being able to control participants to actively participate in web-based or online health programs, and the advantages are the studies are not only improving mental health and reducing suicide risk but also reducing stigma in participants because they can communicate anonymously in forums. Thus, these interventions increase motivation to utilize mental health assistance from online professionals and can take a large sample of participants. The good thing about the campus is that online assistance for mental health becomes an area for suicide prevention and reducing stigma, as well as a more innovative, effective, and efficient time and place. Further research can involve more institutions in the studies (for example by helping to promote and motivate students to join the program).

V. CONCLUSION

This systematic review aimed to study various forms of suicide prevention on college students and identify the most effective and efficient interventions program on campus. The findings showed that the more innovative, effective and efficient suicide prevention on college students was the web-based or online intervention. The use of suicide prevention and interventions for college students can be applied on campus by providing the program in the form of protocols or standard operating procedures, but it can also be done by facilitators, lecturers, staff and students.

CONFLICT OF INTEREST

No conflicts of interest have been declared.

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REFERENCES

- [1] Bestari, *Mahasiswa, 25 kiat mahasiswa menjawab tantangan era otonomi daerah, masyarakat ekonomi ASEAN hingga generasi Indonesia Emas 2045*. Bandung: Alfabeta, 2015.
- [2] Bantjes, Saal, Lochner, and Roos, "Inequality and mental healthcare utilisation among first - year university students in South Africa," *Int. J. Ment. Health Syst.*, pp. 1–11, 2020.
- [3] Kim, Shin, Myung, and Fava "Deformities of the Globus Pallidus are Associated with Severity of Suicidal Ideation and Impulsivity in Patients with Major Depressive Disorder," no. May, pp. 1–10, 2019.
- [4] Tsong, J. T. Young, Killer, and Takemoto, "Suicide Prevention Program on a Diverse College Campus : Examining the Effectiveness of a Peer-to- Peer Model Suicide Prevention Program on a Diverse College Campus ;," *J. College Stud. Psychother.*, vol. 00, no. 00, pp. 1–14, 2018.
- [5] Wolitzky-taylor *et al.*, "Suicide prevention on college campuses : What works and what are the existing gaps ? A systematic review and meta-analysis," *J. Am. Coll. Heal.*, vol. 0, no. 0, pp. 1–11, 2019.
- [6] Rein, McNeil, Hayes, and Hawkins "Evaluation of an avatar-based training program to promote suicide prevention awareness in a college setting," vol. 66, no. 5, pp. 401–411, 2018.
- [7] Lin, Ko, Wu, Oei, Lane, and Chen, "Archives of Suicide Research The Effectiveness of Dialectical Behavior Therapy Skills Training Group Vs . Cognitive Therapy Group on Reducing Depression and Suicide Attempts for Borderline Personality Disorder in Taiwan The effectiveness of dialectical behavior therapy skills training group vs . cognitive therapy group on reducing depression and suicide attempts for borderline personality disorder in Taiwan," vol. 1118, 2018.
- [8] Wilks, Wang, and Arunagiri "Exploring Preference To Avoid Or Seek Help In Person And Online Among College Students With Suicidal Ideation," vol. 38, no. 10, pp. 811–835, 2019.
- [9] Simon, Spesht, and Doederlein, "Coping With Suicidal Thought: A Survey Of Personal Experience"HHS Public Access," vol. 67, no. 9, pp. 1026–1029, 2017.
- [10] Frick, Butler, Scott, Gabriele, Butler, and Scott, "Universal suicide screening in college primary care," *J. Am. Coll. Heal.*, vol. 0, no. 0, pp. 1–6, 2019.
- [11] Chakraborty and Halder, "Identifying Suicidal Risk in College Going Students : A Comparative Study Among Students Staying at Hostel and," vol. 13, no. 2, pp. 341–348, 2018.
- [12] Osman, Bage, and Guetierrez, "The Suicide Behaviors Questionnaire-Revised (SBQ-R) - Overview," no. 5, pp. 4–6, 2001.
- [13] King *et al.*, "Online Suicide Risk Screening and Intervention With College Students : A Pilot Randomized Controlled Trial," vol. 83, no. 3, pp. 630–636, 2015.
- [14] Garnier-villarreal, "Mediating Effects of Positive Thinking and Social Support on Suicide Resilience," *West. J. Nurs. Res.*, vol. Vol. 41(1), pp. 25 –41, 2019.
- [15] Vandeusen, Ginebaugh, and Walcott, "Campus Suicide Prevention : Knowledge , Facts , and Stigma in a College Student Sample," 2015.
- [16] Jacqueline, David, Scott, and Locey N.S, "Developing adaptive treatment strategies to address suicidal risk in college student: A pilot Sequential, Multiple Assignment, Randomized Trial (SMART)," vol. 22, no. 4, pp. 644–664, 2019.
- [17] Shannonhouse, Lin, Shaw, and Wanna, "Suicide Intervention Training for College Staff: Program Evaluation and Intervention Skill Measurement," vol. 8481, no. June, 2017.
- [18] Choi, Park, and Suarez, "Feasibility of A Web-Based Suicide Awareness Programme for Asian American college Students," *BMJ Open*, pp. 1–10, 2016.
- [19] Aldrich, Wilde, and Miller, "The effectiveness of QPR suicide prevention training," 2018.
- [20] Silk, K.Evan, Perrault, and Samantha "Evaluation of a Social Norms Approach to a Suicide Prevention Campaign Evaluation of a Social Norms Approach to a Suicide Prevention Campaign," vol. 0730, no. January, 2017.

[21] S Rosalie, and Aldrich, “Archives of Suicide Research Suicide Prevention : College Students Intention to Intervene Suicide Prevention : College Students Intention to Intervene,” vol. 1118, no. July, 2016.

APPENDIX

Table 2. Comparison of interventions on suicide prevention among college students selected studies

No	Study	Population	Intervention	Comparison	Outcomes	Study Design
1	[6]	N=2.727	Kognito training	Pre test & Post test	All modules produce significant gains in preparedness, likelihood, and self-efficacy of interventions in providing assistance to students with problems, and help students at risk of suicide. Assessments were completed online without supervision resulting in non-compliance and overlapping of participants. The intervention can cover a large number of participants.	Pre Experiment One Group Pre test-Post test
2	[7]	N= 82	Cognitive Therapy Group (CTG)	DBTSTG	CTG had a greater improvement in cognitive distortion. Both interventions were effective in treating depression and suicide attempt for BPD. There is only 1 of therapist for the two different groups. The study had lower dropout rate and higher attendance rate.	Randomized design
3	[8]	N=816	Online assistance psychotherapy using social media	self-help application and online education	Suicidal thought was positively correlated with intention to seek help online with a significant result. This intervention has higher stigma and shame on respondents and has less effect.	Cross-sectional
4	[13]	N=76	Electronic Bridge (eBridge) of Mental Health Services online interventions	No intervention	Students assigned to eBridge reported significantly higher readiness for aid scores, lower stigma levels and were more likely to link to mental health care.	RCT
5	[10]	N= 1.607	Training for staff and students of primary treatment implementation for suicide program	No intervention	Documentation consistency, utilization of safety warnings, mental health referrals, and subsequent appointments increased significantly. Nevertheless, standards do not routinely assess sexual orientation and gender identity data, so reporting taken from this program is minimal.	Quasi-experimental research
6	[11]	N= 120	Screening for students living in dormitories.	Screening for students living with families (at home).	There were no significant differences in suicidal risk behavior among students living in dormitories and with families (at home). It does not depend on the place where students live, but rather on social support thereby increasing mental and physical well-being. Detailed analysis of personality, temperament and type of social support has not been done in the study. Suicidal thoughts and behaviors are tools to predict information about risk factors so that early	Cross-Sectional

					identification can be overcome by providing intervention.	
7	[14]	N=131	Collective Self-Esteem Scale (CSE) and Positive Thinking Skills Scale (PTSS)	No intervention	The study found a significant effect of positive thinking and social support on suicide resistance. ($p < 0.01$). This is the first study to examine the mediating effects of positive thinking and social support to increase suicide resistance among students in a university.	Cross-sectional
8	[9]	N=611	Peer support and emergency clinics.	The self-care, including social activities, positive affirmations, exercising, and spiritual practices.	Peer support is used less often but is also considered beneficial, emergency clinics and telephone clinics are rarely used and are considered less profitable. The self-care strategies most commonly used include engaging in social activities, using positive affirmations, exercising, and engaging in personal spiritual practices. The study was not able to describe the respondents' characteristics, the amount reached by the survey, and did not discuss reluctance to talk with therapists regarding suicidal thoughts	Cross-sectional
9	[15]	N= 819	Suicide Prevention (SP)	No intervention	Students who get prevention Suicide (SP) result in higher knowledge and lower stigma. The homogeneity of the sample limits the generalization, and there was selection bias due to the response rate. This intervention is beneficial for increasing suicidal knowledge, reducing the stigma associated with problems seeking mental health treatment.	Cross-Sectional
10	[16]	N=62	Adaptive treatment strategies	No intervention	This study has high recruitment rates, lower dropout treatment rates, rare study dropouts, and counselors can provide suicide-focused approaches with loyalty. Treatment satisfaction is high among clients and counselors. This finding is not conclusive because of the small sample.	A Pilot Sequential, Multiple Assignment, Randomized Trial (SMART)
11	[17]	N=51	Suicide intervention training for college staff	No intervention	Limited sample from one university. The intervention involving campus staff provides the most immediate help for students who are at risk of suicide.	Quasi-experimental research
12	[18]	N=227	Web-based suicide awareness program for Asian American	Web-based suicide awareness program for Hispanic	Suicide awareness through Asian American videos is significantly lower for cultural relevance than non-Hispanic people. With anonymity, the response rate becomes higher and reducing stigma.	Cross-sectional, web-based
13	[19]	N= 108	QPR suicide prevention training	No intervention	QPR training significantly improved attitudes, subjective norms, and perceived behavioral control regarding suicide interventions. The response to peers is complicated as a whole because more women than men are interested in offering to help their distressed colleagues. Several post-tests were not finished due to boredom and lack of understanding. However, this study can build a	Quasi-experimental research

					culture of suicide prevention on campus.	
14	[20]	N= 391	Social Norms Approach to a Suicide Prevention Campaign	No campaign	Students who received a social norm campaign reported a more significant effect than those who did not. But, several students from the 'no campaign' group attended the campaign.	Quasi-experimental research
15	[21]	N= 1065	Suicide Prevention	No intervention	Attitudes, subjective norms, and perceived behavioral control significantly estimate intention to help intervene. There were some biases. However, this study recruited large samples and let the participants independently complete the intervention.	Cross-Sectional