



The Teacher Expectations and Values for Suicide Prevention Scale

Confirmatory Factor Analysis and Validation

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Abstract. *Background:* Teachers play a critical role in youth suicide prevention, yet few psychometrically sound instruments exist to measure teachers' expectations and values regarding suicide prevention. *Aims:* This study examined the factor structure and psychometric properties of the Teacher Expectations and Values for Suicide Prevention (TEVSP) Scale. *Method:* The TEVSP was administered to 500 teachers in the United States. Confirmatory factor analysis was used to determine the factor structure and bivariate correlations were used to investigate convergent and discriminant validity. Mann–Whitney *U* tests investigated group differences in TEVSP scores between participants who had received suicide training and those who had not. *Results:* Results support a three-factor hierarchical model with strong internal consistency and evidence of validity. Significant differences were found in TEVSP scores between groups. *Limitations:* There is a need to further explore the psychometric properties of the scale across samples and face-to-face methods. *Conclusion:* The TEVSP is a sound instrument that can be used to measure teachers' expectations and values for suicide prevention.

Keywords: youth suicide, self-efficacy, teacher suicide prevention scale, outcome expectations

Suicide is the second leading cause of death among youth ages 10–24 in the United States (Centers for Disease Control [CDC], 2017). Moreover, 17.2% of students in Grades 9–12 reported seriously considering attempting suicide and 13.6% made a suicide plan (CDC, 2017). Early identification and intervention are essential aspects of mitigating suicide risk among youth (Torok, Callear, Smart, Nicolopoulos, & Wong, 2019). Since young people spend much of their time in school, it is likely that teachers will work with students at risk for attempting suicide. Therefore, teachers play a critical role as gatekeepers by recognizing warning signs and referring students who need support to mental health professionals (Kolves, Ross, Hawgood, Spence, & De Leo, 2017). The important role that teachers play in suicide prevention is highlighted by the development of suicide prevention trainings that aim to improve suicide literacy, attitudes, and interventions among school staff (e.g., Campbell, Stickl Haugen, Sutter, & Lambie, 2019; Lamis, Underwood, & D'Amore, 2017).

Teachers' engagement in suicide prevention efforts may be influenced by their efficacy and outcome expectations to identify and support students at risk of suicide. Bandura's Social Cognitive Theory (SCT; 1982, 1989) highlights self-efficacy as one's belief in their ability to affect change, which impacts how one approaches tasks and challeng-

es. Therefore, it is important to evaluate and understand teachers' beliefs in their ability to successfully intervene with students at risk of suicide. Similarly, expected outcomes are defined as outcomes individuals anticipate to occur and are important drivers of human behavior (Bandura, 1989); if teachers feel they cannot make a difference in preventing a student from dying by suicide, it is unlikely they will engage in prevention and intervention activities. Thus, it is valuable to understand teachers' efficacy and outcome expectations related to suicide prevention. Moreover, suicide training can have a valuable impact on teachers' efficacy expectations. In a systematic review of the effectiveness of suicide prevention training, Torok et al. (2019) found that teachers' self-efficacy to intervene with at-risk youth significantly increased after suicide training.

Numerous studies have investigated the efficacy, attitudes, and outcome expectations of teachers regarding suicide prevention (Sylvara & Mandracchia, 2019; Tompkins, Witt, & Abraibesh, 2010; Wyman et al., 2008); however, few psychometrically sound instruments currently exist to measure related constructs among teachers. Several scholars have used the unnamed scale developed by King, Price, Telljohann, and Wahl (1999), referred to hereafter as the "Teacher Expectations and Values for Suicide Prevention (TEVSP)" Scale. The TEVSP was embedded in

a 45-item questionnaire and included 14 items to explore high school health teachers' ($n = 228$) response to their role in suicide prevention. Initial face validity and content validity were established through expert review. Following principal axis factoring, scale developers identified three subscales including Efficacy Expectations (six items; perceived self-efficacy for suicide prevention), Outcome Expectations (six items; perceived outcomes of engaging in suicide prevention), and Outcome Values (two items; perceived value placed on engaging in suicide prevention).

Several scholars have used the TEVSP, highlighting its value in suicide prevention and crisis research. For example, scholars employed and modified the TEVSP to explore the impact of gatekeeper training in higher education (Sylvana & Mandracchia, 2019), effects of crisis training on pre-service teachers (Alker, 2004), and teachers' perceived self-efficacy to identify and intervene with suicidal youth (Anderson, 2004; Appleby, 2016). However, despite the frequent use of the scale, no studies have validated the factor structure and psychometric soundness of the instrument. The lack of psychometric analysis is problematic as there are several limitations. First, King et al. (1999) created their instrument with a developmental sample of high school health teachers who may be more aware of public health risks and comfortable discussing challenging topics compared with general education teachers. It is therefore not known whether the TEVSP demonstrates similar factor structure and psychometric properties with a broader sample of teachers. Second, King et al. (1999) did not provide any evidence of validity for the TEVSP beyond face and content validity established during initial development. Thus, there is a need to explore whether the TEVSP demonstrates additional evidence of validity (e.g., convergent and discriminant validity), which is critical to investigate the soundness of a measure (Kline, 2005). Finally, there is a need to determine whether the hypothesized latent structure of items and their relationships are consistent across independent samples, as recommended by instrument development best practices (Boateng et al., 2018). Thus, a test of dimensionality in an additional sample would provide important information regarding the factor structure and stability of the model.

Current Study

The aim of the present study was to explore the factor structure, reliability, and validity of the TEVSP as scholars have highlighted the need for replication studies to support scale validation (Sandford, Kirtley, Lafit, Thwaites, & O'Connor, 2020). Given the multiple uses of the TEVSP across the literature, enhancing the psychometric soundness of the instrument may increase the utility of the

scale for future research. This study had three aims: (a) to investigate the factor structure and internal consistency of the TEVSP among a broad sample of teachers; (b) to investigate evidence of discriminate and convergent validity of the TEVSP; (c) to explore differences in TEVSP scores between teachers who had engaged in suicide prevention training and those who had not. Since efficacy and outcome expectations often increase following suicide prevention training (Torok et al., 2019), higher scores on the TEVSP among teachers who received training may provide additional support for the validity of the instrument.

Method

Procedure

Following Institutional Review Board approval, recruitment and data collection were conducted through Amazon Mechanical-Turk, a web-based labor portal. Potential participants were offered a \$.50 incentive to complete an online questionnaire via Qualtrics.

Participants

The sample included 500 currently practicing PK-12 teachers in the United States from elementary ($n = 210$), middle school ($n = 184$), high school ($n = 158$), and other (e.g., multiple levels, pre-k-1st grade; $n = 7$) settings (participants indicated all levels that were applicable). Elementary teachers were included in the analysis since suicide is not uncommon among elementary-aged children and there is a need for suicide prevention during these critical developmental years (Sheftall et al., 2016). The sample included approximately equal numbers of females ($n = 242$; 48.9%) and males ($n = 252$; 50.9%), with one individual identifying as non-binary/third gender (0.2%). The majority of participants identified as Caucasian/White ($n = 313$; 63.5%), followed by Black or African American ($n = 74$; 15%), Asian ($n = 39$; 7.9%), Hispanic/Latinx ($n = 34$; 6.9%), multiracial ($n = 24$; 4.9%), and American Indian or Alaskan Native ($n = 9$; 1.8%), with a mean age of 33.22 years ($SD = 8.30$; range 19–80). Overall, participants had a mean of 6.11 years of experience ($SD = 5.12$; range 0 [first year teaching] to 36). The majority of participants had attended in-service suicide training in the past 5 years ($n = 320$; 64%) and a little less than half ($n = 226$; 45.2%) reported seeking out suicide training on their own.

Measures

Teacher Expectations and Values for Suicide Prevention Scale

The TEVSP developed by King and colleagues (1999) is a 14-item self-report instrument designed to measure teachers' efficacy expectations, outcome expectations, and outcome values related to youth suicide. The TEVSP was modified in the current study, as the wording to several items was adapted to enhance applicability to teachers in general (i.e., changed *health teacher* to *teacher*) and was changed to avoid stigmatizing language (e.g., *commit suicide* was changed to *die by suicide*). Each item has a 7-point Likert-type response scale ranging from 1 (*strongly disagree*) to 7 (*strongly agree*) across three subscales: (a) Efficacy Expectations (six items; e.g., "I believe I can recognize a student at risk of attempting suicide"); (b) Outcome Expectations (six items; e.g., "I believe if I recognize a student at risk of attempting suicide it will reduce the chance that the student will die by suicide"); and (c) Outcome Values (two items; e.g., "I believe as a teacher, one of the most important things I could ever do would be to prevent a suicidal student from dying by suicide"). King et al. (1999) found good internal consistency across subscales ($\alpha_{\text{efficacy expectations}} = .84$; $\alpha_{\text{outcome expectations}} = .89$; $\alpha_{\text{outcome values}} = .60$).

Gatekeeper Efficacy and Reluctance Scale

The Gatekeeper Efficacy and Reluctance Scale (Wyman et al., 2008) is a 16-item measure designed to evaluate school staff's preparedness and reluctance to engage in suicide prevention as gatekeepers. Wyman et al. (2008) established content validity through examination by expert reviewers and identified a two-factor solution through principal component analysis including: (a) Gatekeeper Efficacy ([GE] seven items; e.g., "I feel comfortable discussing suicide issues with my students"), and (b) Gatekeeper Reluctance ([GR] nine items; e.g., "I am too busy to participate in suicide prevention activities"). Higher scores on the first factor reveal greater efficacy and preparedness to perform the gatekeeper role in the school setting, whereas higher scores on the second factor reveal greater reluctance to engage with suicidal students. Further evidence of validity was established as Wyman et al. (2008) identified higher GE scores and lower GR scores following training as expected (e.g., Torok et al., 2019). Several scholars have used these subscales and found adequate internal consistency ranging from Cronbach's α .63 to .85 (Ewell-Foster et al., 2017; Jacobson, Osteen, Sharpe, & Pastoor, 2012). Internal consistency in the current study was $\alpha_{\text{GE}} = .50$; $\alpha_{\text{GR}} = .86$. Considering the alpha value for GE and previous research supporting the scale's internal consistency, Guttman's lambda-2 (Guttman, 1945) was investigated as it provides a more accurate representation of lower bounds

since the alpha value can significantly underestimate reliability (Sijtsma, 2009). Results indicated acceptable reliability: $\lambda-2_{\text{GE}} = .60$; $\lambda-2_{\text{GR}} = .88$.

Data Screening

Data ($N = 500$) were screened for missing values and tested for statistical assumptions in SPSS (version 26.0). In order to explore the pattern of missingness, Little's (1988) missing variable analysis was used to assess each scale and subscale. Missing values were only identified in the GR subscale (0.2% missing); Little's MCAR test was not significant indicating missing data were ignorable (Osborne, 2013). Missing values were addressed using single imputation through expectation-maximization, a rigorous procedure that uses an algorithm to impute missing data based on expected values (Scheffer, 2002).

Data were checked for statistical assumptions, indicating a satisfactory sample size with a 36:1 participant-to-item ratio – exceeding the recommended 10 cases per item (Kline, 2005). Inferential tests of normality revealed nonnormal data. A significant Shapiro-Wilk's test result ($p < .05$) and visual inspection of histograms and QQ plots indicated data were nonnormally distributed, with a skewness range of $-.968$ – $.607$ and a kurtosis range of $-.217$ – $.632$. Therefore, nonnormality was accounted for in analytical methods.

Data Analysis

Confirmatory factor analysis (CFA) was conducted using Mplus (Muthén & Muthén, 1998–2017). CFA is a multivariate statistical technique to verify the factor structure and examine latent and manifest variables that are theorized to represent hypothesized constructs (Mvududu & Sink, 2013; Schreiber, Stage, King, Nora, & Barlow, 2006). Based on the three-factor TEVSP model identified by King et al. (1999), a three-factor hierarchical model was investigated (i.e., first-order factors loading onto a higher-order general factor). While this model is empirically equivalent to a three-factor oblique model, it is conceptually distinguishable (Bludworth, Tracy, & Glidden-Tracey, 2010). The hierarchical model was explored because there is no known exploration of the possible existence of a general factor (i.e., overall teacher expectations and values for suicide prevention) within the conceptual structure of the TEVSP. Most scholars have used the subscales as separate measures and did not calculate total scale scores (e.g., Appleby, 2016; Sylvara & Mandracchia, 2019). However, it would be valuable to explore the TEVSP as a scale that could measure teachers' overall expectations and values

for suicide prevention (total scale score) along with examining individual subscale scores.

Given the nonnormality of data, robust maximum likelihood estimation was applied for model specification (Sattora & Bentler, 1994). Several fit indices were used as outlined by Mvududu and Sink (2013) and Hu and Bentler (1999), including the following: chi-square goodness of fit (GOF; non-significant χ^2 , $p > .05$ indicates good fit), standardized root mean square residual (SRMR; $< .08$ considered good fit), the root mean squared error of approximation (RMSEA; $< .06$ indicate good fit), the comparative fit index (CFI; $\geq .95$ indicate good model fit), and the Tucker-Lewis index (TLI; $> .90$ adequate fit, $> .95$ good fit).

Following CFA, we assessed the TEVSP scores for reliability and evidence of validity. Correlations between the TEVSP and the GE and GR scores were examined using Spearman rank-order (Spearman's ρ) correlations to assess convergent and discriminant validity ($r = .10$, small; $.30$, medium; $> .50$ large; Cohen, 1988). Lastly, given the non-normality of data, Mann-Whitney U tests were used to calculate group differences in TEVSP scores between teachers who had attended suicide training and those who had not. An approximate value for r was calculated to determine effect size. Responses to two demographic questions were used for analysis including: (a) "Have you attended any in-service trainings offered to teachers at your school or district on youth suicide in the past 5 years?"; and (b) "Have you attended any form of training on your own in the area of youth suicide in the past 5 years?" (i.e., outside conferences, online trainings, etc.; Appleby, 2016). Train-

ing recency was included since the benefit of training may weaken over time (Shtivelband, Alouis-Young, & Chen, 2015).

Results

Confirmatory Factor Analysis

The three-factor hierarchical TEVSP model represents the first three order factors (i.e., Efficacy Expectations, Outcome Expectations, and Outcome Values) and a higher-order factor (i.e., overall expectations and values [OEV] for suicide prevention; see Figure 1). CFA identified that all 14 observed variables were related to the latent constructs as indicated by standardized outer loadings that ranged from .507 to .758. The GOF was significant for the model $\chi^2 (74) = 173.461$, $p < .001$, denoting an inadequate fit; however, large sample sizes ($N > 400$) often result in a significant GOF index, suggesting additional indices must be considered (Mvududu & Sink, 2013). Additional fit indices indicated an overall good fitting model: SRMR = .04, RMSEA = .05, CFI = .95, TLI = .93. The TEVSP indicated strong internal consistency for the scale as a whole ($\alpha = .92$) and across each subscale ($\alpha_{\text{efficacy expectations}} = .815$; $\alpha_{\text{outcome expectations}} = .864$; $\alpha_{\text{outcome values}} = .708$).

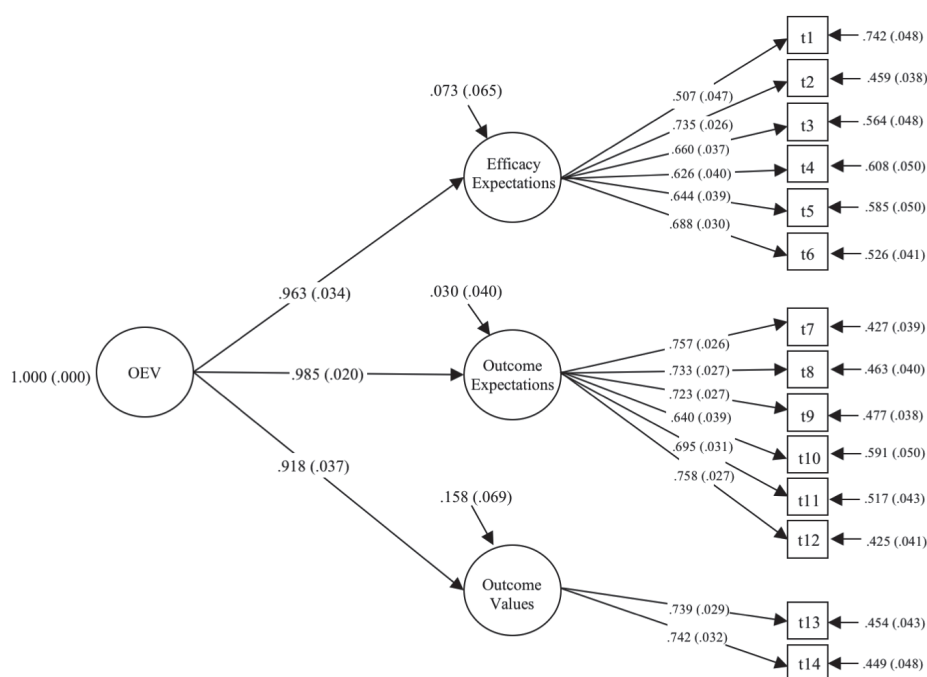


Figure 1. TEVSP three-factor hierarchical model with standardized path coefficients. TEVSP = Teacher Expectations and Values for Suicide Prevention (TEVSP) Scale.

Evidence of Validity

Convergent and Discriminant Validity

To examine evidence of convergent validity, bivariate correlations were used to assess the relationship between TEVSP scores and GE scores. The correlations between the TEVSP total scale scores and GE scores revealed a positive medium correlation ($\rho = .468, p < .01$; 21.90% of the variance). Similarly, all three TEVSP subscale scores positively correlated with the GE scores including Efficacy Expectations ($\rho = .461, p < .01$; 21.25% of the variance), Outcome Expectations ($\rho = .436, p < .01$; 19.01% of the variance), and Outcome Values ($\rho = .375, p < .01$; 14.06% of the variance).

In order to assess discriminant validity, bivariate correlations were used to examine the relationship between the TEVSP and GR scores. The overall TEVSP scale scores revealed a significant, albeit small, negative correlation with GR scores ($\rho = -.156, p < .01$; 2.43% of the variance). Efficacy Expectations subscale scores did not reveal a significant correlation with GR scores ($\rho = -.038, p = .398$); however, Outcome Expectations and Outcome Values subscales indicated small and medium negative correlations respectively ($\rho = -.186, p < .01$; 3.46% of the variance; $\rho = -.346, p < .01$; 11.97% of the variance).

Suicide Training Group Differences

TEVSP scores were higher in teachers who had received in-service suicide training in the past 5 years ($M = 5.49, SD = .961, Mdn = 5.68$) than those who had not ($M = 5.06, SD = 1.05, Mdn = 5.07$), $U = 22063, z = -4.346, p < .001, r = .19$). Similarly, a significant difference was found between TEVSP scores among teachers who sought out suicide training. Teachers who pursued suicide training had higher TEVSP scores ($M = 5.45, SD = .985, Mdn = 5.64$) than those who had not ($M = 5.24, SD = 1.03, Mdn = 5.29$), $U = 27417.5, z = -2.205, p = .027, r = .099$).

Discussion

In response to the call for replication studies supporting scale validation (Sandford et al., 2020) and the need to examine the psychometric soundness of the TEVSP, this study examined the factor structure, internal consistency, and evidence of validity of the adapted TEVSP scale. Results with a broader sample of teachers supported the three-factors initially proposed by King et al. (1999). Aligned with SCT (Bandura, 1989), Efficacy and Outcome Expectations are important components that drive human behavior, highlighting the value of the TEVSP in measuring teachers' beliefs in their ability to intervene with students

at risk of suicide and potential outcomes of their prevention efforts. Moreover, Outcome Values indicate the value that teachers place on suicide prevention efforts. Each unique factor allows practitioners and scholars to measure and evaluate specific aspects of teachers' response to suicide prevention. For example, an individual may have higher Efficacy Expectation scores yet fail to recognize the positive outcomes that could occur if they intervened with a student at risk of suicide (Outcome Expectations). As a result, intentional training could focus on the positive outcomes that occur when teachers refer students to professional support in hopes they may recognize the significant outcomes of their prevention efforts.

A unique contribution of this study is the exploration of a three-factor hierarchical model demonstrating good fit with the data. This model provides conceptual clarity to the instrument including first-order factors (i.e., Efficacy Expectations, Outcome Expectations, and Outcome Values) that load onto a higher-order general factor (i.e., overall expectations and values for suicide prevention). To date, most scholars have examined the subscales separately (Appleby, 2016; Sylvara & Mandracchia, 2019); however, results suggested that the TEVSP can be conceptualized as a multidimensional instrument containing one general factor that is made up of a combination of three unique subscales. Aligned with this conceptualization, researchers and practitioners can calculate TEVSP total scores to evaluate teachers' overall expectations and values toward suicide prevention, as well as calculate subscale scores to examine more specific indicators of efficacy, outcomes, and values.

The TEVSP revealed strong internal consistency and evidence of convergent and discriminant validity supporting the psychometric soundness of the instrument (Kline, 2005). Overall, the evidence of discriminant and convergent validity provides valuable empirical support for continued use of the TEVSP, which was not previously investigated. The TEVSP total scores, as well as subscale scores, positively correlated with GE scores (Wyman et al., 2008). These moderate (rather than high) correlations support the uniqueness of the TEVSP scale and subscales, while also highlighting the shared variance with the GE scale (Kline, 2005). In addition, the TEVSP total scores and subscale scores demonstrated initial evidence of discriminant validity; overall, the correlations were small and noticeably lower than the correlations with the GE scale, which may be the most important indicator of discriminant validity (Hubley, 2014).

TEVSP total scores were higher in teachers who had attended suicide training than in those who had not, supporting previous research that suicide prevention training can increase efficacy and expected outcomes among participants (Lamis et al., 2017; Torok et al., 2019). Given previous research supporting this connection, findings

provide additional evidence of validity for the TEVSP. However, the results should be interpreted with caution as there is limited information on the type, rigor, or length of self-reported trainings. Thus, there may be variability in participants' training experiences, which likely contributed to the small effect sizes characterizing groups differences; likewise, the relatively large data set may also have been a contributor.

Notably, scholars have failed to identify strong evidence that suicide training results in behavioral outcomes, despite increases in self-efficacy. In a systematic review of the impact of suicide prevention training, Torok et al. (2019) found that despite increases in self-efficacy among teachers following suicide training, there was insufficient evidence that training programs impacted behavioral change (e.g., implementation of prevention skills). Therefore, the subscales of the TEVSP may be valuable tools to inform suicide training efforts by exploring multiple aspects of teachers' expectations and values that may be associated with behavioral outcomes.

The TEVSP may also be used as a tool by practitioners to improve suicide prevention efforts across school levels. Through examining the specific components of teachers' expectations and values for suicide prevention at each level, practitioners can develop training strategies to target specific growth areas. For example, considering the call for suicide prevention efforts in the elementary years (Shettall et al., 2016), administering the TEVSP to elementary teachers may provide valuable insight regarding teachers' expectations and values for suicide prevention with younger students. Findings may support training efforts related to developmentally appropriate suicide prevention during the elementary years.

Limitations and Future Research

Several limitations should be noted when interpreting the findings. First, given the online nature of recruitment, no information was available on response rates potentially limiting the representative nature of the sample. It may be that teachers who were interested in suicide prevention work were more attracted to taking the survey. In addition, although scholars have supported the viability of research conducted through online labor portals (Behrend, Sharek, Meade, & Wiebe, 2011), the only method of data collection was through online methods. It would be beneficial for researchers to validate the TEVSP across additional samples and investigate results of face-to-face administration of the scale. Another limitation was the lack of information to determine the type or length of exposure participants had to suicide trainings. Thus, group differences between

those who had attended training and those who had not should be interpreted with caution. Finally, while the present study was the first to further validate the TEVSP, there is a need for additional validation as there are limitations with correlating self-report measures as evidence of validity, which are not indicative of predictive or concurrent validity. Test-retest reliability studies would also be beneficial to investigate the stability of the TEVSP over time.

Conclusion

The present study supports the unique contribution of the adapted TEVSP scale as one of the few psychometrically sound measures validated with teachers, who play a critical role in youth suicide prevention efforts. The instrument demonstrated sound factor structure, internal consistency, and evidence of validity. The TEVSP is a viable scale that may provide baseline data for teachers' overall expectations and values regarding suicide prevention and a suitable evaluation tool for suicide prevention trainings. Scale validation is a lengthy process (Kline, 2005) and thus more work is needed to examine additional psychometric properties of the instrument. However, initial evidence suggests that the TEVSP is a sound instrument to assist with youth suicide prevention training, research, and evaluation.

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