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Tolerance for Mental Pain Scale (TMPS): Italian validation and evaluation of its protective role in depression and suicidal ideation

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## **Tolerance for Mental Pain Scale (TMPS): Italian Validation and Evaluation of its Protective role in Depression and Suicidal Ideation**

### **1. Introduction**

Mental pain has been receiving international recognition as a transdiagnostic construct related to many psychiatric conditions (Guidi et al., 2019) and a potential predictor of suicidal behavior (Shneidman, 1993). Shneidman (1993) theorized that mental pain was a key factor in depression and suicidal risk, defining it as “psychache” to describe the unbearable psychological pain, in which the person feels a variety of negative emotions, such as guilt, shame, loneliness, fear, humiliation, and angst, resulting from the thwarting of basic human needs. Orbach et al. (2003) describe mental pain as a series of subjective experiences that include the perception of negative changes in both cognitive and emotional aspects of the self. Mental pain is not necessarily associated with psychopathology and could be experienced by anyone in certain circumstances (Tossani et al., 2019). However, research primarily examined such construct in its most severe form, when mental pain reaches its extreme of intolerability and the risk for suicidal behavior is enhanced (Svicher et al., 2019). Nonetheless, the intensity of mental pain by itself is not enough for explaining suicidal risk. In fact, a study conducted with Israeli soldiers indicated that levels of mental pain were not significantly related to the probability of suicidal behaviors and that tolerance for mental pain (i.e., the capacity to endure mental pain; Shneidman, 1993) acted as a moderator of this relationship – i.e., mental pain was associated with suicidal behavior mainly when soldiers reported being less able to tolerate the pain (Shelef et al., 2015). Other studies conceptually replicated this finding indicating that suicidal risk reaches its highest level

when mental pain becomes unbearable and tolerance for mental pain exhausts (Becker et al., 2018; Meerwijk et al., 2013).

Given that mental pain could be experienced by anyone in certain circumstances and that is related to psychopathology, it is important to assess the extent to which people are able to tolerate the aversive experience of mental pain not only among patients at risk for suicide but also in the general population (i.e., community non-clinical samples). Up to now, the Tolerance for Mental Pain Scale (TMPS; Orbach et al., 2004) is the only reliable and valid instrument measuring tolerance for mental pain. In its original version, the scale included 20 items tapping three facets of tolerance of mental pain: Ability to Tolerate Pain Surfeit, Ability to Cope with Mental Pain, and Ability to Contain Mental Pain. This three-factor structure has been empirically validated in three studies conducted with both clinical samples (suicidal inpatients and non-suicidal psychiatric inpatients) and community non-clinical samples (Becker et al., 2018; Levinger et al., 2015; Soumani et al., 2011). Cronbach alphas of the three factors ranged from .72 to .93, and the TMPS was able to discriminate between suicidal inpatients and psychiatric inpatients (Becker et al., 2018; Levinger et al., 2015). Recently, the trifactorial structure was not confirmed in a U.S. community sample (Meerwijk et al., 2019). Rather, Meerwijk et al. (2019) reported that a two-factor solution provided the best goodness of fit to the data, with one factor representing active coping with mental pain (Managing the Pain) and the other representing a more passive way of coping (Enduring the Pain). Moreover, they chose 10 items from the original TMPS (the five most representative items of each factor) to create a brief 10-item version of the scale (TMPS-10). This brief version displayed good psychometric properties (Cronbach alphas of .90 for the managing pain factor and .84 for the enduring pain factor) and

was able to discriminate between participants with previous suicide attempts and those without previous suicide attempts in both U.S. community sample and a Turkish clinical sample (Demirkol et al., 2019; Meerwijk et al., 2019). According to Meerwijk et al. (2019), heightened suicide risk can best be predicted by lower scores on both the Managing the Pain and Enduring the Pain factors.

Giving the conflicting evidence in the literature regarding the factorial structure of the Tolerance for Mental Pain Scale (Becker et al., 2018; Meerwijk et al., 2019; Soumani et al., 2011) and the fact that, up to now, there is currently no instrument measuring tolerance for mental pain in Italian, the first aim of this study was to examine the psychometric proprieties of both the 20-item and 10-item TMPS versions in an Italian community non-clinical sample. For this purpose, we translated the TMPS into Italian, examined the factorial structure of both the 20-item TMPS and the 10-items and the psychometric properties of the instrument. We examined construct validity of the scale by analyzing the extent to which the new Italian TMPS was coherently associated with intensity of mental pain. We also investigated gender measurement invariance of the instrument in order to check whether the TMPS and its factorial structure can be reliably and validly applied to both women and men. The second aim of the study was to examine the protective role of tolerance for mental pain for depressive symptomatology and suicidal ideation.

## **2. Methods**

### *2.1. Scale translation*

Two independent translations of the 20-item TMPS scale (Orbach et al., 2004) from English to Italian were carried out by two experienced bilingual clinical psychologists. After

comparing the two translations, a first Italian version of the scale was developed and submitted to a native English translator for back-translation (Van de Vijver and Leung, 1997). This version was piloted on 20 participants in order to evaluate its clarity. Adjustments were implemented based on this pilot study, and a final version of the Italian 20-item TMPS was, therefore, created.

## *2.2. Participants and recruitment procedure*

A total of 204 Italian participants between 18 and 68 years participated in this study. Inclusion criteria were being at least 18 years old and be a native Italian speaker. After signing informed consent, participants completed an online battery of questionnaires, implemented on Qualtrics software. They were primarily recruited through advertisement on Facebook. The recruitment materials presented the study as “The Psychological Resources Study” and informed respondents that their participation was voluntary. Participants who already agreed to participate were also invited to share the survey with friend and relatives and to spread the word about the study (snowball sampling procedure). This research was approved by the University of Bologna ethics committee.

## *2.3. Measures*

### *2.3.1. Sociodemographic and clinically relevant variables*

Participants indicated their age (via date of birth), gender, marital status, nationality, education, and employment. They also answered questions concerning the following clinically relevant variables: current chronic physical illness (yes/no), current psychological distress (yes/no), life history of participation in psychological treatments (yes/no), current use of psychopharmacological drugs (yes/no), and suicidal attempts in the past (yes/no; only 7 participants reported having attempted suicide in the past).

### 2.3.2. Tolerance for mental pain

The Tolerance for Mental Pain Scale (TMPS; Orbach et al., 2004) is a self-report instrument that assesses experiences of psychological pain and is composed of 20 items rated on a 5-point Likert scale, ranging from 1 (*not true*) to 5 (*very true*). The 20-item version is composed of three subscales: (1) Ability to Tolerate Pain Surfeit – and to cope with it proactively (e.g., “*I can* get the pain out of my mind” or “The pain *doesn't* fills me up completely” – italic is used to underline reverse items compared to the actual items appearing in the scale); (2) Belief in the Ability to Cope with Pain – hope that pain will go away together with acceptance of the pain (e.g., “Although it’s tough to bear the pain, I know that it will go away” or “I believe that time will make the pain disappear”); (3) Containing the Pain – ability to contain the pain without being overwhelmed (e.g., “The pain is not too much to take”). In previous studies, the Ability to Tolerate Pain Surfeit and Belief in the Ability to Cope with Pain factors demonstrated good internal consistency (Cronbach alphas ranging from .79 to .93), while the Containing the Pain factor exhibited moderate psychometric properties (Cronbach alphas ranging from .61 to .71) (Meerwijk and Weiss, 2018; Orbach et al., 2004). Scores are obtained by averaging items of each factor, with higher scores indicating higher tolerance for mental pain.

Meerwijk et al. (2019) selected 10 items of the TMPS and developed the TMPS-10 scale, containing two factors: (a) Managing the Pain, which represents an active way of coping with the pain (e.g., “*I can* get the pain out of my mind,” – italic is used to underline reverse items compared to the actual items appearing in the scale), and (b) Enduring the Pain, which assesses a more passive way of coping (e.g. “I believe that the time will make the pain disappear”). Both

factors demonstrated good internal consistency, with Cronbach alphas of .90 for Managing the Pain and .84 for Enduring the Pain (Meerwijk et al., 2019).

### *2.3.3. Intensity of mental pain*

The Orbach & Mikulincer Mental Pain Scale (OMMP; Orbach et al., 2003) was used to assess the intensity of mental pain. The Italian version (Tossani et al., 2019) is composed of 31 items, including five factors: Irreversibility (e.g., “The difficult situation will never change”), Narcissistic Wounds (e.g., “I feel abandoned and lonely”), Emotional Flooding (e.g., “My feelings change all the time”), Freezing and Loss of Control (e.g., “I feel paralyzed”) and Emptiness (e.g., “I can’t find meaning in my life”). Participants rated the self-descriptiveness of each item on a 5-point scale, ranging from 1 (*not at all*) to 5 (*very strongly*). Total scores are computed by summing up items belonging to each of the five OMMP factors. Higher scores reflect the experience of more intense mental pain. The Italian version demonstrated good psychometric properties (Tossani et al., 2019) and Cronbach alphas in the current sample for each of the five OMMP factors were adequate, ranging from .83 to .93.

### *2.3.4. Depression and suicidal ideation*

The 21-item Beck Depression Inventory-II (BDI-II) was used to assess depression (Beck et al., 1996). Each item presents a specific depressive symptom and participants indicated the extent to which they experienced this symptom during the last month by choosing one of four alternative answers. A total score is computed by summing up each participant's answers, with higher scores reflecting more intense depression. In the current sample, Cronbach alpha for the 21 items was .89.



Apart from computing the total BDI-II score, we also isolated participants' responses to item 9 of the scale tapping suicidal ideation (rated on a four-point scale ranging from "I don't have any thoughts of killing myself " to "I would kill myself if I had the chance") and included it among the assessed clinically-relevant variables.

#### 2.4. Data analysis

Confirmatory factor analyses (CFAs), exploratory structural equation modelling (ESEMs), measurement invariance analyses, and regression analyses were performed with *Mplus* 8.3 with the robust maximum likelihood estimator (MLR; Muthén and Muthén, 1998-2018). All other analyses were conducted with the IBM SPSS version 24.

##### 2.4.1. Factor analysis

In order to test whether the original factor structure of both the 20-item and 10-item versions of the TMPS would be replicated in the current Italian sample, two confirmatory factor analyses (CFAs) were conducted: one for the original 20-item TMPS and one for the abbreviated TMPS-10. In case of inadequate CFA fit indices, exploratory structural equation modelling was carried out (ESEM; Asparouhov and Muthén, 2009; Marsh et al., 2014). ESEM combines advantages of exploratory factor analysis (EFA) and CFA, such as the calculation of a model fit, and permits items with cross-loadings to load on more than one factor (Marsh et al., 2009). All factor analyses were estimated with the robust maximum likelihood estimator (MLR), and oblique Geomin rotation was used in ESEM analyses (Marsh et al., 2009). The following parameters were utilized to assess goodness of fit of the model: Chi Square, ratio of Chi Square divided by degrees of freedom ( $\chi^2/df < 2$ ), Comparative Fit Index (CFI) and Tucker-Lewis Index (TLI) values  $> .90$ , the Root Mean Square Error of Approximation (RMSEA) values  $\leq .08$ , and

Standardized Root Mean Square Residual (SRMR) values  $\leq .09$  (Marsh et al., 2009). As recommended (Hair et al., 2016), loadings on the main factor had to be  $\geq .32$  ( $p \leq .05$ ), cross-loadings were considered meaningful at or above  $.10$  ( $p \leq .05$ ).

#### 2.4.2. Psychometric properties

Internal reliability of the 20-item TMPS and TMPS-10 was assessed with Cronbach alpha values above  $.70$  considered as acceptable and above  $.80$  as good (Cortina, 1993).

Intercorrelations between TMPS factors and associations of these factors with age, depression, and suicidal ideation were assessed with Pearson correlations. Their associations with dichotomous sociodemographic and clinically-relevant variables were assessed with *t*-tests.

*Construct validity* was analyzed with Pearson's correlations between TMPS scores and intensity of mental pain (OMMP factors) scores.

#### 2.4.3. Measurement invariance

We tested gender (male vs. female) invariance of the Italian TMPS. In particular, we examined: a) configural invariance - factors have the same pattern of free and fixed loadings, meaning that TMPS items have a *similar* meaning across gender groups; b) metric invariance - equivalence of item loadings on the factors, meaning that not only the pattern of loadings is maintained but also their *strength*, thus TMPS factors have the same unit of measurement across groups – i.e., male and female ascribe the *same* meaning to TMPS factors; and c) scalar invariance - equivalence of factor loadings and item intercepts, meaning that the mean differences in Italian TMPS factors capture all mean differences in the shared variance of the items – therefore, it is possible to compare latent means across groups (Putnick and Bornstein, 2016). To establish measurement invariance, the following three criteria being indicative of

noninvariance were analyzed:  $\Delta\chi^2_{SB}$  significant at  $p < .05$ ,  $\Delta CFI \geq -.010$ , and  $\Delta RMSEA \geq .015$  (Chen, 2007; Satorra and Bentler, 2001). Invariance is confirmed if at least two out of three criteria for invariance are met. Consistently with guidelines for conducting measurement invariance, it was necessary to have at least 50 participants for each group in order not to commit Type I error (Finch et al., 2018).

#### *2.4.4. Protective role of tolerance for mental pain*

With regard to the protective role of tolerance for mental pain, we conducted simultaneous multiple regressions examining the joint and unique contribution of the Italian TMPS scores to the total depression (BDI-II) score and the suicidal ideation score (as indexed by BDI-II's item 9).

### **3. Results**

#### *3.1. Sample characteristics*

The sample was composed by 204 Italian adults, 71% female, aged 18 to 68 ( $M = 29.4$ ,  $SD = 11.7$ ). Almost all participants (98.5%) were of Italian nationality, and 82.4% were non-married. Descriptive statistics for other assessed variables are presented in Table 1.

#### *3.2. Factor analysis of the Italian TMPS*

As indicated by CFA, the original three-factor structure of the TMPS had unsatisfactory model fit:  $\chi^2(167) = 603.561$ ,  $p < .001$ ;  $CFI = .794$ ;  $TLI = .766$ ;  $RMSEA = .113$ ;  $RMSEA CI = [.104, .123]$ ;  $SRMR = .100$ . Therefore, ESEM analyses were performed. First, a three-factor solution was tested in order to be consistent with the original version. However, some items had to be discarded and the Italian three factor solution did not replicate the three factors of the original TMPS. In addition, one of its factors included only two items (items 3 and 4). ESEM

analyses were further performed to explore a two-factor and a one-factor solution. However, these two solutions still had inadequate model fit (see table in supplementary material). Thereby, we moved towards examining the factorial structure of the TMPS-10 proposed by Meerwijk et al. (2019).

Fit indices of the CFA of the Italian TMPS-10 were satisfactory for the original two-factor model:  $\chi^2(34) = 62.830, p < .001$ ; CFI = .967; TLI = .957; RMSEA = .064; RMSEA CI = [.039, .089]; SRMR = .055. This factor structure fully replicated Meerwijk et al. (2019) findings (factor loadings are reported on Table 2).

In order to explore a one-factor solution for the TMPS-10, an ESEM was also conducted. One item (item 11: “I believe that if I do the right thing, the pain will disappear”) did not comply with the criteria set for allocating an item to a specific factor and was eliminated. A new ESEM was conducted on the remaining 9 items leading to a one-factor solution that, however, had inadequate model fit:  $\chi^2(27) = 290.190, p < .001$ ; CFI = .697; TLI = .596; RMSEA = .219; RMSEA CI = [.196, .242]; SRMR = .134.

Given the problematic three-factor and two-factor solutions of the 20-item TMPS and the better goodness of model fit of the two-factor solution of the TMPS-10, this version of the measure was the one that we finally validated in Italian. Results from now on are presented only for the TMPS-10. The Italian TMPS-10 final version had a total mean score of 3.69 ( $SD = 0.75$ ), while the Managing the Pain and Enduring the Pain factor had total mean scores of 3.77 ( $SD = 0.94$ ) and 3.60 ( $SD = 0.86$ ) respectively. Cronbach alphas for both the Managing the Pain and Enduring the Pain factors were good (respectively,  $\alpha = .86$  and  $.78$ ). Correlation between the two factors was significant and moderate ( $r = 0.37, p < .001$ ).

### *3.3. Associations between Italian TMPS-10 factors and sociodemographic and clinically relevant variables*

Pearson's correlations between Italian TMPS-10 scores and age are presented in Table 3. Means, standard deviations, and *t*-tests for TMPS-10 scores according to sociodemographic and clinically relevant dichotomous variables are presented in Table 4. Age was negatively and weakly associated with the Enduring the Pain factor. There were no statistical differences in the Italian TMPS-10 scores as a function of gender, working and academic status. On the other hand, the Italian TMPS-10 scores were significantly lower for participants reporting current psychological distress, current use of psychopharmacological drugs, and previous suicide attempts compared to participants who provided a negative answer to these questions (see Table 4). The total TMPS-10 and Managing the Pain factor scores were also significantly lower in participants reporting current participation in psychological treatments. Scores on the Enduring the Pain factor were significantly lower for participants reporting presence of current chronic physical illness (see Table 4). More important, the TMPS-10 scores were significantly associated with depression and suicidal ideation – with participants scoring higher on tolerance of mental pain being less likely to report depressive symptoms and suicidal ideation (see Table 3).

### *3.4. Construct validity*

As can be seen in Table 3, all the correlations between the TMPS-10 scores and the five mental pain factors were statistically significant. All the correlations were negative, indicating that the higher the tolerance for mental pain, the lower the reported intensity of mental pain. This finding reinforces our confidence in the construct validity of the TMPS-10.

### *3.5. Measurement invariance*

As indicated in Table 5, all levels (i.e., configural, metric, full scalar) of invariance for gender were established in the Italian TMPS-10. Results, therefore, demonstrated that the two-factor structure of the TMPS-10 equally applies to male and female. Because full invariance was achieved, we were able to explore differences in latent means for total TMPS scores as well as for the two TMPS subscales (Managing the Pain and Enduring the Pain) across groups. Analyses revealed that there were no significant differences in gender for both total TMPS scores and its factors.

### *3.6 The contribution of tolerance for mental pain to depression and suicidal ideation*

The second aim of this study was to examine the protective role of tolerance for mental pain in depressive symptomatology and suicidal ideation. Because of the moderately strong correlations between the two TMPS-10 factors, we controlled for their association by simultaneously entering the two factors in regression analyses predicting the total depression (BDI-II) score and the suicidal ideation score (BDI-II's item 9). We first entered the total TMPS-10 score and repeated the analyses with the two subscales of tolerance for mental pain. The first regression analyses indicated that the total TMPS-10 score significantly predicted total depression score,  $F(1,202) = 100.892, p < .001$ , explaining 33% of its variance ( $\beta = -.577, p < .001$ ). Furthermore, the two TMPS-10 factors significantly predicted the total depression score as well,  $F(2,201) = 57.751, p < .001$ , and explained 36% of its variance. Results revealed that both the Managing the Pain and Enduring the Pain factors made unique significant contributions to the total depression score,  $\beta = -.519, p < .001$ , and  $\beta = -.172, p < .001$ , respectively. Specifically, the higher a participant's tolerance of mental pain (higher scores on Managing the Pain and Enduring the Pain factors), the less intense the depressive symptoms.

With regard to suicidal ideation (BDI-II's item 9), results indicated that the TMPS-10 total score significantly predicted suicidal ideation,  $F(2,201) = 22.420, p < .001$ , and explained 18% of its variance ( $\beta = -.388, p < .001$ ). However, only the Managing the Pain factor made a unique significant contribution to the prediction of suicidal ideation,  $\beta = -.400, p < .001$ . Enduring the Pain factor didn't significantly predict suicidal ideation ( $\beta = -.063, p > .05$ ). Specifically, when simultaneously entering both TMPS-10 factors in the regression, only Managing the Pain explained suicidal ideation (i.e., the higher a participant's scores on Managing the Pain, the less intense the suicidal ideation).

#### **4. Discussion**

The purpose of the present study was to examine the psychometric properties of the Italian version of the Tolerance for Mental Pain Scale (TMPS) as well as to investigate its protective role in depressive symptomatology and suicidal ideation. Firstly, confirmatory and exploratory factor analyses were conducted on the original 20-item version of the instrument (Orbach et al., 2004) but model fits were not satisfactory. Therefore, a confirmatory factor analysis was carried out on the brief 10-item version of the scale (TMPS-10, Meerwijk et al., 2019). This analysis revealed that the two-factor solution of the TMPS-10 had satisfactory goodness of fit and that the item composition of each of the two factors fully replicated the findings of Meerwijk et al. (2019) reported in a U.S. community sample. The current findings clearly indicated that the TMPS-10 had a more valid factorial structure than the original 20-item version and that the two-factor solution proposed by the U.S. group (Meerwijk et al., 2019) demonstrated the best goodness of fit compared to the original three-factor version or to an alternative one-factor solution.

On this basis, the TMPS-10 and its two-factor version was retained in the new Italian scale. The first factor is Managing the Pain, which can be interpreted as effective ways to contain the pain. The second factor is Enduring the Pain, which can be interpreted as optimistic thoughts about the future. The difference between the two factors lies in their approach to mental pain. In the Managing the Pain factor, mental pain is effectively handled so that it does not interfere with daily life (e.g., “I *can* concentrate because of my pain”). In contrast, in the Enduring the Pain factor, mental pain is experienced in everyday life, but alleviated by an optimistic vision of the future about pain passing (e.g., “Although it’s tough to bear the pain, I know that it will go away”). The two factors represent two different coping strategies to bear the pain, ultimately aiming at reducing distress and increasing well-being in the immediate present or the near future (Meerwijk et al., 2019; Orbach et al., 2004). Becker et al. (2018) further highlighted that tolerance for mental pain might belong to a series of positive psychological resources (such as optimism, hope, mastery, and self-esteem). Therefore, the two TMPS-10 factors may provide mental health professionals with a new perspective for understanding their clients’ resources as well as evaluating coping strategies aimed to prevent suicide and identifying people who are at risk for suicide and depression.

The Italian TMPS-10 demonstrated satisfactory internal consistency of the two factors. Findings also provided supportive evidence on the construct validity of the Italian TMPS-10. Specifically, the two tolerance for mental pain factors were significantly associated with less intense mental pain. This study also established full (configural, metric, and scalar) invariance of the TMPS-10 for gender, meaning that using the instrument’s observed means scores lead to valid and unbiased assessments for both male and female.



In the current sample, we observed no significant gender difference in the two TMPS-10 scores. This finding fully replicated Meerwijk et al.'s (2019) findings on lack of gender differences in TMPS-10 scores in an U.S. community sample ( $N = 225$ ). Again, in line with Meerwijk et al.'s (2019) findings, we found that age was negatively and weakly associated with the Enduring the Pain factor. However, Demirkol et al. (2019) in a Turkish validation of the TMPS-10 did not find any significant association between age and TMPS-10 scores in a clinical group, but revealed a positive moderate correlation between age and TMPS-10 in a non-clinical group. Due to the scarcity of evidence, we cannot explain the source of these differences between the various studies. More research examining the associations between gender, age, and tolerance for mental pain in both clinical and non-clinical populations is needed.

The Italian TMPS-10 scores were also significantly lower for participants reporting current psychological distress, current use of psychopharmacological drugs, and previous suicide attempts. These findings are in line with Meerwijk et al. (2019) and Demirkol et al. (2019)'s findings. Furthermore, the total TMPS-10 score and the Managing Pain factor (but not the Enduring Pain factor) were significantly lower in participants reporting current participation in psychological treatments. This finding might indicate that people still maintain an optimistic outlook on mental pain (no reduction in enduring the pain) while being in psychotherapy, which, in turn, can help them in tolerating the pain and can produce better therapeutic outcomes. Further research should attempt to identify the specific types of therapies or therapeutic techniques that facilitate endurance of mental pain while being in therapy and those who directly contribute to active management of the pain. For example, mindfulness-based therapies might be particularly effective in augmenting endurance of mental pain, whereas cognitive-behavioral therapies might

be effective in fostering active management of the pain. Finally, scores on the Enduring the Pain factor were significantly lower among participants reporting presence of current chronic physical illness. Future studies should investigate how this lack of optimistic outlook on mental pain among people with severe chronic physical illness might put them at risk for depression and suicide.

The second aim of the current study was to examine the protective role of tolerance for mental pain in depression and suicidal ideation. It is well-known that the experience of intense mental pain increases suicidal risk (e.g., Shelef et al., 2015; Levinger et al., 2015) as well as risk for other psychiatric diseases, such as depression (e.g., VanHeeringen et al., 2010; Orbach et al., 2004). Our findings fitted this line of research and clearly showed that higher tolerance for mental pain was predictive of less intense depression. Specifically, both Managing the Pain and Enduring the Pain factors made unique contributions to weakened depression. However, only the Managing the Pain factor but not the Enduring the Pain factor made a significant unique contribution to reduced suicidal ideation.

Previous studies investigated mostly the relationship between tolerance for mental pain and suicide attempts in both a U.S. community sample (Meerwijk et al., 2019) and a Turkish clinical sample composed of patients diagnosed with depression (Demirkol et al., 2019). However, the link between tolerance for mental pain and suicidal ideation has been neglected. In the Three-Step Theory of Suicide (Klonsky and May, 2015), psychological pain together with hopelessness are assumed to be associated with suicidal ideation and to move the person from ideation to action, thereby heightening suicidal risk. Therefore, tolerance to mental pain can be viewed as a distal resource reducing suicidal ideation and as a protective factor in the first step of

the process leading to suicide (Klonsky and May, 2015). Our study corroborated this line of thinking, but when entering both TMPS-10 factors in regression analyses, only Managing the Pain seemed to be predictive of reduced suicidal ideation. This finding might be explained by the fact that, according to Baumeister (1990) and Shneidman (1993), people with high suicidal ideation cannot think about their past or their future and just have a temporal perspective restricted to the present in which their pain is unbearable. This constricted temporal focus is in contrast with the enduring the pain construct which is associated with an optimistic possibility of thinking to a different future.

Findings from the present study should be interpreted in the context of the following limitations. First, all data were collected via an online survey and self-report measures, with most of the respondents being women, unmarried, and under 40 years of age, which might limit the generalizability of the finding. In the literature it is well known that, compared to men, women are more inclined to develop depressive symptoms (Piccinelli and Wilkinson, 2000). Second, even though the sample size for this study was consistent with guidelines for conducting factor analyses in validation studies (i.e., with a ratio of 10 participants per item to assure an adequate sample size; Tabachnick et al., 2007), higher sample size might increase the power to detect differences in depressive symptomatology and suicidal risk. In fact, in our sample only a few reported having attempted suicide in the past. Third, we assessed suicidal ideation with a single item instead of using a multi-item scale for this purpose. Fourth, the cross-sectional design limits inferences about the causal directionality among tolerance for mental pain, depression, and suicidal ideation.

Future studies should examine the relationship between tolerance for mental pain within the Three-Step Theory of Suicide (Klonsky and May, 2015), using a multi-item scale of suicidal ideation. Longitudinal research is also required to examine the prospective contribution of TMPS-10 scores to depression and suicidal risk over time. Future studies should be conducted with clinical samples and take advantage of other assessment techniques (e.g., behavioral observations, clinician ratings) to evaluate measurement invariance in clinical populations and establish criterion-related validity for the Italian TMPS-10. Moreover, they should attempt to examine changes in tolerance for mental pain following different therapeutic interventions and to reveal which therapeutic factors are associated with those changes, with the aim of finding appropriate therapeutic means for increasing tolerance for mental pain.

In conclusion, the Italian TMPS-10 is a psychometrically sound measure of tolerance for mental pain in Italian adults. The Italian TMPS-10 shows potential utility in research designed to advance theoretical and empirical understanding of tolerance for mental pain in clinical and non-clinical samples. The instrument may also assist in evaluating coping strategies aimed to prevent suicide and identifying people who are at risk for suicide, depression and other psychiatric conditions. Given the global rise in depression and its association with mental pain and suicidal risks, this study innovatively highlighted the protective role of tolerance for mental pain in depression and suicidal ideation.

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**Table 1.** Descriptive data on participants' sociodemographics, clinically relevant variables and mental pain ( $N = 204$ ).

	% ( $n$ )	$M$ ( $SD$ )	Range	$\alpha$
<i>Sociodemographics</i>				
Age		28.39 (11.66)	18-68	
Gender (female)	71 (145)			
Currently studying	56 (114)			
Currently working	27 (55)			
<i>Clinical relevant variables</i>				
Presence of chronic physical illness	11.3 (23)			
Current psychological distress	37.3 (76)			
Participation in psychological treatments	46.1 (94)			
Use of psychopharmacological drugs	24.5 (50)			
Previous suicidal attempts	3.4 (7)			
Suicidal ideation (BDI-II item 9)		0.22 (0.48)	0-3	
BDI-II total score		5.88 (2.67)	0-60	.89
<i>Mental pain – OMMP subscales</i>				
Irreversibility		21.24 (7.86)	9-45	.91
Lack of control and freezing		29.28 (9.69)	10-50	.93
Narcissistic wound		12.61 (5.19)	6-30	.89
Emotional flooding		8.93 (3.17)	3-15	.84
Emptiness		5.88 (2.67)	3-15	.83

*Note.* OMMP = Orbach & Mikulincer Mental Pain Scale; BDI-II = Beck Depression Inventory-II.

**Table 2.** Confirmatory factor analysis of the Italian two factors Tolerance for Mental Pain Scale-10 (TMPS-10).

Items	TMPS-10 factors	
	Managing the Pain	Enduring the Pain
4. I can not concentrate because of my pain	.633	
7. I suffer very much	.697	
9. I cannot contain the pain inside me	.798	
12. I cannot get the pain out of my mind	.798	
19. The pain is too much to take	.837	
1. I believe that my pain will go away		.751
8. I believe that time will make the pain disappear		.869
11. I believe that if I do the right thing, the pain will disappear		.598
16. Although it's tough to bear the pain, I know that it will go away		.701
17. I believe that I will find a way to reduce the pain		.762

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**Table 3.** Correlation between Tolerance for Mental Pain Scale-10 (TMPS-10) scores, age, mental pain, depression and suicidal ideation.

Variables	Managing the Pain	Enduring the Pain	Total TMPS-10
<i>Italian TMPS-10</i>			
Managing the Pain	-	0.37**	0.84**
Enduring the Pain	-	-	0.81**
Age	0.05	-0.16*	-0.06
<i>Mental pain – OMMP subscales</i>			
Irreversibility	-0.67**	-0.49**	-0.71**
Lack of control and freezing	-0.64**	-0.29**	-0.58**
Narcissist wounds	-0.57**	-0.42**	-0.60**
Emotional flooding	-0.53**	-0.21**	-0.46**
Emptiness	-0.43**	-0.26**	-0.42**
Depression (total BDI-II score)	-0.58**	-0.58**	-0.36**
Suicidal ideation (BDI-II's item 9)	-0.39**	-0.42**	-0.21**

*Note.* \*  $p < .05$ , \*\*  $p < .01$ ; OMMP = Orbach & Mikulincer Mental Pain Scale; BDI-II = Beck Depression Inventory-II.

**Table 4.** Means, standard deviations, and *t*-tests for Tolerance for Mental Pain Scale-10 (TMPS-10) scores, according to sociodemographic and clinically relevant dichotomous variables.

Variables	Women / Yes <i>M (SD)</i>	Men/No <i>M (SD)</i>	<i>t</i>
Gender (female, <i>n</i> = 145)			
Total TMPS-10	3.64 (0.78)	3.80 (0.66)	1.36
Managing the Pain	3.73 (0.98)	3.89 (0.84)	1.11
Enduring the Pain	3.56 (0.91)	3.70 (0.74)	1.14
Currently studying (yes, <i>n</i> = 114)			
Total TMPS-10	3.71 (0.70)	3.65 (0.81)	0.58
Managing the Pain	3.72 (0.93)	3.84 (0.97)	0.84
Enduring the Pain	3.70 (0.78)	3.47 (0.96)	1.93
Currently working (yes, <i>n</i> = 55)			
Total TMPS-10	3.75 (0.77)	3.66 (0.75)	0.77
Managing the Pain	4.01 (0.90)	3.69 (0.95)	2.17
Enduring the Pain	3.50 (0.95)	3.64 (0.84)	1.02
Presence of chronic physical illness (yes, <i>n</i> = 23)			
Total TMPS-10	3.47 (0.73)	3.71 (0.75)	1.50
Managing the Pain	3.69 (0.82)	3.78 (0.96)	0.46
Enduring the Pain	3.24 (0.84)	3.65 (0.86)	2.11*
Current psychological distress (yes, <i>n</i> = 76)			
Total TMPS-10	3.27 (0.80)	3.93 (0.60)	6.77**
Managing the Pain	3.21 (0.95)	4.11 (0.77)	7.33**
Enduring the Pain	3.33 (0.87)	3.76 (0.83)	3.57**
Participation in psychological treatments (yes, <i>n</i> = 94)			
Total TMPS-10	3.55 (0.85)	3.81 (0.63)	2.50*
Managing the Pain	3.58 (1.00)	3.94 (0.87)	2.75*
Enduring the Pain	3.51 (0.91)	3.67 (0.82)	1.33
Use of psychopharmacological drugs (yes, <i>n</i> = 50)			
Total TMPS-10	3.36 (0.85)	3.79 (0.69)	3.67**
Managing the Pain	3.44 (1.02)	3.88 (0.90)	2.95*
Enduring the Pain	3.28 (0.87)	3.70 (0.84)	3.06*
Previous suicide attempts (yes, <i>n</i> = 7)			
Total TMPS-10	3.00 (0.93)	3.71 (0.73)	2.49*
Managing the Pain	3.06 (1.27)	3.80 (0.92)	2.05*
Enduring the Pain	2.94 (0.94)	3.62 (0.86)	2.05*

Note. \*  $p < .05$ , \*\*  $p < .01$ .

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**Table 5.** Italian Tolerance for Mental Pain Scale-10 (TMPS-10) gender measurement invariance.

	Model fit				Model comparisons					
	$\chi^2$	<i>df</i>	CFI	RMSEA [90% CI]	Models	$\Delta\chi^2$	$\Delta df$	<i>p</i>	$\Delta$ CFI	$\Delta$ RMSEA
<i>Gender invariance</i> (male, <i>n</i> = 59, vs. female, <i>n</i> = 145)										
M1 - Configural	101.803	68	.952	.070 [.039, .097]						
M2 - Metric	108.270	76	.954	.065 [.033, .091]	M2-M1	6.601	8	.580	.002	-.005
M3 - Full scalar	118.261	84	.951	.063 [.033, .088]	M3-M2	9.987	8	.266	-.003	-.002

Note.  $\chi^2$  = Chi-square; *df* = degrees of freedom; CFI = Comparative Fit Index; RMSEA [90% CI] = Root Mean Square Error of Approximation and 90% Confidence Interval;  $\Delta$  = change in the parameter.