



Development and validation of a mandarin version of demoralization scale for adolescents and young adults

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Abstract

The impact of demoralization among the general population has received little attention due to the lack of an appropriate measurement. Three studies involving 1,143 high school and undergraduate students in Taiwan were thus conducted to develop and validate a tool to assess demoralization. A pool of 50 items was first developed and administered to high school students. Exploratory factor analysis results supported a 5-factor solution with 15 items (Study 1). Study 2 compared the potential models using confirmatory factor analysis and found the 5-factor second-order model with 15 items the best fit model. The 15-item Mandarin version of Demoralization Scale (DS-M-15) was also found to have good internal consistency, test–retest reliability, and (concurrent and predictive) validity in a sample of undergraduate students (Study 3). Taken together, the converging findings show that the DS-M-15 is a promising tool for assessing demoralization among Chinese adolescents and emerging adults.

Keywords Adolescents · Asia · Demoralization · Self-report · Young adults

Mental health has received greater attention than ever before. Amidst all factors identified, one that impacts individual well-being the most is demoralization that is the association between a perceived inability to cope with a sense of disheartenment and a loss of hope and meaning (Vehling et al., 2017). For example, Costanza et al. (2020) examined the presence and severity of demoralization in suicidal patients visiting emergency departments. They discovered a strong and positive association between demoralization and suicidal ideation in the patients.

It is noteworthy that demoralization is conceptually different from depression. For instance, Tang et al. (2020) reported depression as a mediator between demoralization and physical aspects of quality of life among cancer patients in Beijing, China. Plain failure to distinguish demoralization from depression has been reported to be accountable for not only delayed treatments but also social withdrawal and suicide ideation among cancer patients (Tang et al., 2015). As such, scholars find it imperative to distinguish between demoralization and depression (Clarke & Kissane, 2002; Clarke et al., 2005; Cockram et al., 2009; Jacobsen et al., 2006).

In addition, it is critical to examine the unique influence demoralization has on well-being. However, the existing measurements of demoralization are mainly developed for adult patients' use, particularly those exhibiting suicidal behaviors and diagnosed with cancer at reported mean age between 34 to 65 years old (Costanza et al., 2020; Hung et al., 2010; Kissane et al., 2004; Tang et al., 2020; Vehling et al., 2017). As a result, a new tool is urgently needed to enable a comprehensive assessment of demoralization on the general population. The present study thus aimed to fill the methodological gap by developing a demoralization scale to measure demoralization specifically for adolescents and emerging adults. In the following sections, we first briefly

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reviewed the definition of demoralization followed by the review of the existing measurements of demoralization. Then, we provided an overview of the present study.

The Conceptualization of Demoralization

Frank (1974) defined demoralization as a sense of incompetence, isolation and despair faced by individuals failing to cope with long term stress. Meanwhile, de Figueiredo and Frank (1982) mentioned demoralization as a subjective incompetence besides feelings (i.e., depression, anxiety, anger and so forth) that arise from emotional distress due to discontentment associated with self-esteem. To them, demoralization and depression are two different entities whereby the former involves helplessness and hopelessness and the latter entails anhedonia. Moreover, depressed people are hardly joyful during the present and future times whereas demoralized people could be joyful at the present moment but feeling gloomy towards the future (Strada, 2009).

To Clarke and Kissane (2002), demoralization is considered as troubles in lives whereby affected individuals would feel helpless, meaningless, hopeless, remorse and so on when facing life problems. They also classified demoralization as a psychological reaction of pain and hopelessness ranging from mild sorrow, low spirit to deep despair. Three important concepts introduced by them are coping, hope, and meaning. Coping incorporating distress management mechanisms is crucial for hindering demoralization. People mostly feel uncomfortable and helpless when inadequate mechanisms fail them, leaving them feeling clueless and miserable. Meanwhile, hope, according to them, is the faith that helps people discover life meanings and accomplish impossible missions in even the most negative situations. People once losing hope will tend to lose out and succumb to demoralization. The last component, meaning, can be accounted for by the concept of assumptive world. One is expected to exhibit his or her beliefs and understandings on the earthly operation. He or she will then be assured of the capability to predict the future in the assumptive world. Any disintegration in the assumptive world may lead to demoralization.

Kissane et al. (2004) indicated that demoralization is a manifestation of existential distress. Based on their clinical experience and observation, they defined demoralization syndrome as “a distinct psychiatric disorder in which loss of meaning and hope can potentially spoil any sense of a worthwhile life and future” (p. 269). They concluded that demoralization is specifically characterized by “non-specific dysphoria, disheartenment, loss of confidence and development of subjective incompetence, loss of meaning, hopelessness and helplessness, social disconnectedness, and desire to die” (p. 270). In the same vein, Li et al. (2015) viewed

demoralization as a state of psychological pain whereby individuals lose control, certainty, meaning and purpose upon permanent daily stress in lives.

Integrating the above mentioned definitions, we follow Tecuta et al. (2015) to define demoralization as “a psychological state characterized by helplessness, hopelessness, a sense of failure and the inability to cope” (p. 673) in the present study.

The Measurement of Demoralization

Tecuta et al. (2015) conducted a systematic review on the existing demoralization assessment instruments that have been validated before. Their results showed the following four instruments that were commonly used to assess demoralization: Psychiatric Epidemiological Research Interview – Demoralization Scale (PERI-D; Dohrenwend et al., 1980), Diagnostic Criteria for Psychosomatic Research (DCPR; Fava et al., 1995), Demoralization Scale (Kissane et al., 2004), and Subjective Incompetence Scale (SIS; Cockram et al., 2009).

The PERI-D functions as a multidimensional self-report questionnaire containing 27 items of eight dimensions: anxiety, sadness, hopelessness-helplessness, dread, confused thinking, poor self-esteem, psychophysiologic symptoms and perceived physical health. Meanwhile, the DCPR primarily provides a conceptual framework and assessment strategy for psychosomatic syndromes in common medical setting, in particular, the identification of 12 psychosomatic syndromes including demoralization in a structured interview involving 58 ‘yes/no’ questions.

Kissane et al. (2004) developed the Demoralization Scale consisting of 24 items on a 5-point Likert scale for participants’ self-report demoralization syndrome. Their analysis on responses from 100 patients with advanced cancer (47 males and 53 females) supported a good internal consistency (Cronbach’s alpha coefficients ranged from 0.71 to 0.94) in the scale (Kissane et al., 2004). Moreover, factor analysis revealed five factors: loss of meaning (loss of meaning and worth connected to role and value in life), dysphoria (unspecific emotions of grief and regret), disheartenment (sense of isolation connected to frustration and loneliness), helplessness (subjective incompetence involving loss of control, hope and so on) and sense of failure (reversed sense of accomplishment, satisfaction and success in life translating into sense of failure). SIS, on the other hand, asks subjects to self-report their weeks prior to the assessment days on its 12-item unidimensional questionnaire. Such measurement is viewed by the authors as prominent clinical features of demoralization.

Although the four instruments are potential tools, we refer to the Kissane et al. (2004) Demoralization Scale to develop

the new tool for three reasons. First, the (unidimensional) scope of the SIS is rather limited, while the DCPR concludes that demoralization rarely happens in healthy participants without medical history. As stated earlier, DCPR measures psychosomatic syndromes whereby demoralization is one of them. Nevertheless, such multiple facets would have limited its potential to measure purely demoralization at its best. Second, the PERI-D seems effective in assessing patients suffering from medical conditions accompanied by chronic pain. Given that the new instrument targets non-patients, the PERI-D does not seem suitable for assessing adolescents and emerging adults without chronic pain. In contrast, the theoretical framework of the Demoralization Scale (Kissane et al., 2004) has been replicated in the Chinese population. Hung et al. (2010) evaluated the Mandarin version of the Demoralization Scale for cancer patients. The back-translated scale by psychiatric and language experts obtained informed consent from 214 patients (58 males, 156 females). Exclusion criteria were those i) who scored cognitive impairment of 24 points and below in the Mini-Mental State Examination (MMSE); ii) who were reluctant; iii) illiterate in Mandarin; iv) diagnosed psychiatric; and v) with low intelligence. The five identified corresponding factors in the scale are found identical with the five factors proposed by Kissane et al. (2004) and the 0.928 Cronbach's alpha was reliable.

Overview of the Present Study

While majority of the past findings were derived from patients, it is believed that the detrimental effect of demoralization will also be observed among the general population (i.e., non-patients). Nevertheless, the existing measurements are not suitable for non-patients and young population. For instance, Hung et al. (2010) Mandarin version of Demoralization Scale was developed mainly to examine cancer patients with majority age range of 51 to 65 years old (52.4%) followed by 36 to 50 years old (26.6%). A new tool is thus imperative for researchers to investigate the effects of demoralization on general population. To achieve this goal, three studies were conducted to develop and validate a Mandarin version of Demoralization Scale to investigate demoralization among adolescents and emerging adults in Taiwan. Based on the findings of Kissane et al. (2004) and Hung et al. (2010), the new Demoralization Scale is expected to be a multidimensional tool with five (first-order) dimensions, which can be accounted for by a second-order factor (i.e., general demoralization). Meanwhile, considering that the perceptions and symptoms of demoralization of non-patients could be somewhat different from patients, it is believed that the dimensions of the new measurement could be different from Kissane et al. (2004).

Study 1

The researchers referred to the literature and existing measurements (e.g., Kissane et al., 2004) to develop a new measurement of demoralization for ordinary adolescents and emerging adults. Guided by the definition and the five factors revealed by the Demoralization Scale for cancer patients (Kissane et al., 2004) and its translated Mandarin version (Hung et al., 2010), the new measurement (of demoralization) was expected to be a multidimensional tool comprising the following dimensions: life meaning; loneliness and helplessness; self-assurance; bravery and perseverance; and emotional distress. Ten items were first generated for each dimension in order to have at least five items for each dimension. Considering that the scale is designed for adolescents, negative-worded items were minimized to reduce the cognitive burden of participants. Three reviewers (a 14-year-old male student, a 16-year-old female student, and a high school teacher) were recruited to review the 50 items using a 5-point Likert scale (1: strongly disagree to 5: strongly agree) to indicate the extent to which they agreed (or disagreed) with the items. The researchers modified the items according to the feedback. The modified items were then verified by an expert to develop the initial version of the scale.

Participants

Two hundred and five students from two public high schools¹ in Taipei participated in Study 1. Considering that demoralization may be a sensitive topic to adolescents, the survey was framed as a development of life concept scale for adolescents.

Results and Discussion

Item analysis was first conducted to examine the corrected item-total correlations for the 50 items. Item with a high value indicates a high association of the item with the other items. Results showed that the correlation coefficients for items 2, 7, 25, and 33 were lower than 0.30 and hence removed from further analysis.

The remaining 46 items were submitted to exploratory factor analysis (EFA). Results based on principle axis factor extraction method and Promax rotation suggested five factors. The Kaiser–Meyer–Olkin measure of sampling adequacy (KMO) was 0.910 and Bartlett's test of sphericity was significant, $\chi^2(1035, N=205) = 5657.857, p < 0.001$.

¹ The researchers were unable to collect demographic data of the participants because the data collection was conducted as a part of the classroom activities.

Table 1 Standardized factor loading of the 15 items of the mandarin version of demoralization scale in three studies

No	Item	Study 1 (<i>N</i> =205)	Study 2 (<i>N</i> =537)	Study 3_T1 (<i>N</i> =401)	Study 3_T2 (<i>N</i> =380)
	Life Meaning	Eigen = 5.01			
1	我現在的生活很滿足 (R)	.908	.835	.885	.890
2	我對現在的生活很滿意 (R)	.804	.818	.849	.871
3	我現在的生活過得不錯 (R)	.702	.812	.852	.831
	Loneliness & Helplessness	Eigen = 1.55			
4	沒有人幫得了我	.748	.694	.679	.727
5	我覺得孤立無援	.774	.739	.829	.849
6	我幫不了自己	.587	.722	.730	.667
	Self-assurance	Eigen = 1.36			
7	我有很棒的特質 (R)	1.005	.849	.721	.863
8	我能看見自己的長處 (R)	.636	.666	.656	.742
9	我是很重要的人 (R)	.535	.743	.817	.816
	Bravery & Perseverance	Eigen = 1.29			
10	我會勇敢面對壓力 (R)	.644	.734	.769	.798
11	我樂於解決困難 (R)	.631	.634	.727	.788
12	我會從錯誤中學習 (R)	.437	.642	.529	.575
	Emotional Distress	Eigen = 1.25			
13	我經常感到後悔	.824	.550	.646	.644
14	我的生活不會有遺憾	.546	.706	.531	.563
15	我害怕不被人接納	.364	.499	.436	.509

T1 Time 1, *T2* Time 2, *Eigen* eigen value, (*R*) item that requires reverse scoring

The 5-factor solution explained 53.937% of the total variance. The five identified dimensions are life meaning (LM); loneliness and helplessness (LH); self-assurance (SA); bravery and perseverance (BP); and emotional distress (ED). To reduce the burden of participants, we selected the five items with the highest factor loading for each of the factor. However, expert panels commented that some selected items of the life meaning, self-assurance, and emotional distress factors conceptually overlapped with other items of the same factors. Therefore, we selected the other items suggested by the experts and teachers to form a 25-item pool.

We then submitted the 25 items to another EFA. The results suggested a 5-factor solution with $KMO = 0.865$ and significant Bartlett's test of sphericity at $\chi^2(300, N = 205) = 2378.344, p < 0.001$ that explained 59.59% of the total variance. While all the items loaded on their target factors, two items of the emotional distress factor loaded on the bravery and perseverance factor, implying that participants perceived the two items differently. To overcome the issue, we extracted the top three items of each factor and conducted EFA on the 15 items. Again, the results showed a 5-factor solution that explained 69.70% of the total variance, $KMO = 0.910$ and Bartlett's test of sphericity was significant, $\chi^2(105, N = 205) = 1200.634, p < 0.001$. All the items loaded on their target factors. The factor loadings ranged from 0.364 to 1.005 (see Table 1).

Although the 15-item model outperformed the 25-item model, the 15-item model was revealed on an exploratory basis. Moreover, one of the factor loadings exceeded 1.00. As a result, it is important to further examine the factorial structure (of the 15-item model) on a new sample using confirmatory factor analysis (CFA).

Study 2

Study 1 developed a 15-item Mandarin version of Demoralization Scale (DS-M-15). The EFA results though promising were derived from an exploratory basis. It is therefore important to further examine the factorial structure of the scale. Study 2 is thus undertaken to test the second-order structure of the DS-M-15 using confirmatory factor analysis (CFA) and to compare the model with other competing structures to identify the best fit model.

Method

Participants and Design A total of 537 students (253 male and 284 female students) were recruited from five high schools in Taipei and Taoyuan using purposive sampling. Three classes were randomly selected from senior one (16 years old), senior two (17 years old), and senior three

Table 2 Goodness-of-fit indices for tests of invariance of demoralization scale study 2

Model	χ^2	df	χ^2/df	CFI	TLI	RMSEA [90% CI]	SRMR
Study 2 ($N=537$)							
1. 1-factor model with 25 items	1899.377***	275	6.91	.725	.700	.105 [.101, .109]	.077
2. 5-factor model with 25 items	1224.222***	265	4.62	.838	.816	.082 [.078, .087]	.070
3. 5-factor second order with 25 items	1603.995***	540	2.97	.824	.804	.086 [.081, .091]	.079
4. 1-factor model with 15 items	907.361***	90	10.08	.722	.675	.130 [.123, .138]	.083
5. 5-factor model with 15 items	188.516***	80	2.36	.963	.952	.050 [.041, .060]	.036
6. 5-factor second order model with 15 items	198.951***	85	2.34	.961	.952	.050 [.041, .059]	.040
Study 3							
1. 5-factor model with 25 items_T1	1060.955***	270	3.93	.829	.810	.086 [.080, .091]	.088
1a. 5-factor model with 25 items_T2	1112.111***	270	4.12	.844	.827	.091 [.085, .096]	.074
2. 5-factor second order model with 15 items_T1	208.218***	85	2.45	.949	.938	.060 [.050, .071]	.048
2a. 5-factor second order model with 15 items_T2	244.411***	85	2.88	.943	.930	.070 [.060, .081]	.055

CFI comparative fit index, TLI/Tucker-Lewis index, RMSEA root-mean-square error of approximation, SRMR standardized root mean square residual, CI confidence interval, T1 results derived from data collected at Time 1, T2 results derived from data collected at Time 2 (two weeks after T1)

*** $p < .001$

(18 years old) of each school. The sample with a mean age of 16.98 ($SD=0.83$) consisted of 190 senior one students, 169 senior two students, and 178 senior three students. Informed consents were obtained from the participants and their parents or guardians.

Instrument The 25 items selected in Study 1 were used in Study 2 to identify the best fit model of the scale. Participants responded to the items on a 5-point scale to indicate the extent to which they (dis)agreed with the items.

Analytic Approach JASP (Ver. 0.10.2) was used to carry out CFAs (with maximum likelihood estimator) to examine the target (15-item second-order factor) model and compare it with another five potential models. The fitness of a model was determined by several widely accepted indicators and their suggested cutoffs: ratio of chi-square to degrees of freedom ($\chi^2/df < 3$, comparative fit index (CFI) and Tucker-Lewis index (TLI) > 0.95 , root-mean-square error of approximation (RMSEA) ≤ 0.05 , and standardized root mean square residual (SRMR) < 0.08 (Hu & Bentler, 1999; Steiger, 2000; Tabachnick & Fidell, 2007). Reliability was examined using Cronbach alpha and MacDonal omega coefficients.

Results and Discussion

Altogether six models were examined in Study 2. The first three models tested the one-factor (Model 1), five-factor (Model 2), and second-order models (Model 3) for the 25 items, while the next three models examined the one-factor (Model 4), five-factor (Model 5), and second-order models

(Model 6) for the 15 items. As shown in Table 2, Model 1 to Model 4 demonstrated poor fit to the data whereas both Model 5 and Model 6 showed good fit to the data. Although Model 5, the five-factor model with 15 items, is slightly superior, the five factors were found highly correlated with each other (Pearson correlation coefficients ranged from 0.510 to 0.715). Moreover, the second-order structure of the Model 6 is consistent with the theory. Therefore, Model 6 (second-order model with five first-order factors for the 15 items) was deemed as the best fit model and thus selected to represent the structure of the scale. The (standardized) factor loadings for the 15 items ranging from 0.499 to 0.849 were significant (see Table 1).

Table 3 shows the reliability results. The Cronbach alpha and McDonald omega coefficients for the overall scale and the five factors were greater than 0.70 except for the emotional distress factor. Similar results were observed for the two gender groups as well as the three age groups. Taken together, the DS-M-15 demonstrated factorial validity and showed acceptable to good internal consistency. Although the results are promising, it is necessary to further examine qualities of the scale. Moreover, both Study 1 and Study 2 focused on adolescents. It would be intriguing to understand applicability of the scale on young adults as well.

Study 3

Study 3 aimed to investigate whether the DS-M-15 applies to and serves as the best fit model for young adults. To achieve this goal, we used the 25 items to compare the two competing models. Moreover, test–retest reliability as well as

Table 3 Reliability for 15-item Chinese Version of Demoralization Scale in Study 2

Factor	Cronbach alpha (McDonald omega)					
	Male	Female	S1	S2	S3	Overall
Demoralization	.875(.871)	.885(.880)	.860(.854)	.890(.886)	.879(.876)	.879(.875)
Meaning	.870(.870)	.857(.852)	.891(.889)	.841(.836)	.874(.845)	.863(.861)
Helplessness	.727(.722)	.795(.794)	.740(.733)	.793(.793)	.750(.749)	.761(.760)
Assurance	.816(.811)	.793(.769)	.782(.774)	.810(.786)	.804(.797)	.800(.789)
Bravery	.730(.723)	.695(.686)	.702(.698)	.723(.709)	.712(.706)	.711(.705)
Emotion	.651(.645)	.573(.558)	.584(.573)	.674(.661)	.577(.568)	.612(.607)

S1 Senior 1 students, S2 Senior 2 students, S3 Senior 3 students; *Meaning* life meaning, *Helplessness* loneliness and helplessness, *Assurance* self-assurance, *Bravery* bravery and perseverance, *Emotion* emotional distress

convergent and concurrent validity of the scale were investigated in Study 3.

Method

Participants and design In this two-stage study, a total of 401 undergraduate students ($M_{\text{age}} = 19.64$, $SD = 1.33$, age ranging from 18 to 26-year-old²) in Taiwan were recruited using convenient sampling at Time 1 (T1). The sample consisted of 98 male, 302 female students, and one missing value. Majority of them were sophomore students (38.15%), followed by junior (27.43%), freshmen (21.95%), senior students (12.22%) and a missing value. The participants answered the survey either through paper-and-pencil or online survey. The same group of students were also invited to answer a follow-up survey two weeks later (i.e., Time 2; T2) to examine test–retest reliability and predictive validity. In total, 380 (94.76% retain rate) participants completed the follow-up survey.

Instruments Four instruments were used in Study 3. The demoralization, hopelessness, and depression scales were administered at T1, while the demoralization and mental health scales were administered at T2 (i.e., two weeks after T1). All the instruments were presented in Traditional Chinese.

Demoralization Scale. The 25 items revealed in Study 1 was used here to compare the 25- and 15-item versions. Participants answered the scale twice: at the first survey (Time 1; T1) and two weeks after the first survey (Time 2; T2).

Beck Hopelessness Scale (BHS; Beck & Steer, 1988). The Traditional Chinese version of BHS (Chen, 2000) was used to measure hopelessness. Students responded to the 20

dichotomous (yes vs. no) items. A higher composite score indicates a higher level of being hopeless towards the future.

Tung's Depression Inventory for College Students (Lin et al., 2008). Participants indicated how often they experienced the issues described in the 32 items presented in Chinese on a 4-point Likert scale (0: never or seldom; 3: always). A high total score represents a high level of depression.

Mental Health Scale (MHS; Tseng, 2008). The 15-item Chinese MHS developed based on Keyes and Magyar-Moe (2003) was administered at Time 2 to examine the respective psychological well-being (6 items), social well-being (5 items), and emotional well-being (4 items) in participants. Individuals responded to the items using a 5-point Likert scale ranging from 1 (*never*) to 5 (*always*). Item 13 was reverse scored prior to the computation of the total score of emotional well-being. Higher scores indicate higher levels of well-being in the dimensions.

Analytic Approach Reliability of the DS-M-15 and the other measurements were examined using both Cronbach alpha and McDonald omega coefficients. Moreover, test–retest reliability of the DS-M-15 was also examined. The results were reported in the Results section. Since hopelessness is one of the components of some demoralization scales (Hung et al., 2010; Kissane et al., 2004; Mullane et al., 2009), discriminant validity of the DS-M-15 was examined by the relationship between demoralization and hopelessness. Concurrent validity was then tested through the relationship between demoralization and depression as past studies have found that highly demoralized people tend to report higher levels of depression (Tang et al., 2020). Finally, as demoralization was found to have a negative relationship with well-being, predictive validity and incremental validity of the DS-M-15 were tested using hierarchical multiple regression. We entered depression score in Step 1 and demoralization score in Step 2 respectively to examine whether and to what extent DS-M-15 score can predict well-being score

² The value was based on 267 participants who responded to the online survey. Age was not collected for those who answered the paper-and-pencil questionnaires due to unexpected technical error.

above and beyond depression measured two weeks after the main study.

Results and Discussion

CFA with maximum likelihood estimator was used to examine and compare the second-order factor model with 25 items and 15 items respectively. In line with Study 2, the 15-item model, but not the 25-item model, showed acceptable fit to the data collected at both T1 and T2. The standardized factor loadings ranged from 0.436 to 0.885 for T1 and 0.509 to 0.890 for T2 (see Table 1).

Reliability Table 4 shows the descriptive statistics, correlation, and reliability for the measured variables. The overall demoralization score and the five factors measured at T1 showed good internal consistency except for the emotional distress subscale. Similar pattern was also observed at T2. Furthermore, the overall demoralization score and the five factors demonstrated good test–retest reliability (within two weeks' interval). Meanwhile, the depression and well-being scales also showed excellent internal consistency. The hopelessness scale, however, was found to have unacceptable internal consistency ($KR_{20} = 0.019$) and hence was excluded from further analysis.

Validity Correlation analysis showed that the overall demoralization score and the five factor scores had a positive relationship with depression and a negative relationship with (psychological, social, and emotional) well-being that was assessed at two weeks' interval. Moreover, hierarchical multiple linear regression analyses were conducted to examine the predictive validity and incremental validity of the DS-M-15. The results (see Table 5 for details) showed that depression had negative effect on psychological well-being. More importantly, after controlling for the effect of depression, overall demoralization score significantly and negatively predicted psychological well-being. The same pattern was also observed in social well-being, and emotional well-being respectively.

Taken together, Study 3 supported that the 15-item second-order factor model is the best fit model. The DS-M-15 also demonstrated good internal consistency and test–retest validity in two-week interval. Furthermore, the positive relationship between DS-M-15 and depression supports the concurrent validity of the DS-M-15, while the negative effect of DS-M-15 on well-being after excluding the effect of depression supports the predictive validity and incremental validity.

General Discussion

Demoralization is harmful to patients' mental health and well-being. Unfortunately, there is a lack of measurement for researchers and practitioners to evaluate demoralization of the general population. The present study thus aimed to develop a Mandarin version of Demoralization Scale specifically for adolescents and emerging adults. The results of three studies across 1,143 adolescents and young adults in Taiwan clearly indicated that the 15-item Mandarin version of Demoralization Scale (DS-M-15) has sound psychometric qualities.

According to literature, demoralization is expected to be accounted for by five dimensions. The results of Study 1 supported a 5-factor solution: life meaning, loneliness and helplessness, self-assurance, bravery and perseverance, and emotional distress. The five dimensions are compatible with the five dimensions (loss of meaning, helplessness, disheartenment, sense of failure, and dysphoria) identified by Kissane et al. (2004). Initially, the top five items of each factor were selected to form the first version of the scale. Nevertheless, some of the items did not load on the target factor and hence, led us to explore a shorter version by choosing the top three items of each factor (i.e., 15 items). Both Study 2 and Study 3 then consistently confirmed that the second-order factor model with 15 items is the best fit model for adolescents and young adults.

Overall, the DS-M-15 demonstrates good reliability and validity. Specifically, it shows good internal consistency for both adolescent and young adults, as well as test–retest reliability for young adults. Furthermore, the DS-M-15 score was found to have a positive association with depression and a negative prediction on psychological, social, and emotional well-being. The results are in line with the literature and offer evidence to the concurrent and predictive validity of the DS-M-15. Unfortunately, the discriminant validity was not tested due to the poor reliability in the chosen hopelessness scale. Moreover, the validity evidence was obtained from undergraduate students. It remains unclear whether the promising properties can be observed on adolescents. Therefore, it is essential for researchers in future studies to examine validity especially discriminant validity of the DS-M-15 for adolescents.

Overall, the main contribution of the present research is bridging the methodological gap of lacking measurement of demoralization for non-patients. The occurrence of the DS-M-15 is also expected to advance demoralization research by allowing researchers and educators to investigate demoralization of the general secondary and university students. This line of research is helpful to extend our understanding of the impact and occurrence of demoralization, if any, on students' mental health and learning performances.

Table 4 Descriptive statistics, reliability, and correlation for variables in study 3

No	Variable	1	2	3	4	5	6	7	8	9	10
1	Demoral	1	.89***	.79***	.89***	.80***	.84***	.66***	-.84***	.67***	.83***
2	Meaning	.85***	1	.61***	.79***	.65***	.67***	.54***	-.76***	.61***	-.80***
3	Helplessness	.79***	.61***	1	.59***	.46***	.61***	.68***	-.64***	-.51***	-.71***
4	Assurance	.86***	.71***	.57***	1	.72***	.66***	.53***	-.82***	-.64***	-.72***
5	Bravery	.80***	.56***	.47***	.67***	1	.61***	.45***	-.69***	-.56***	-.58***
6	Emotion	.79***	.55***	.50***	.58***	.63***	1	.55***	-.64***	-.50***	-.68***
7	Depression	.71***	.59***	.73***	.53***	.46***	.55***	1	-.55***	-.49***	-.67***
8	PsyWB	-.75***	-.65***	-.59***	-.70***	-.62***	-.51***	-.55***	1	-	-
9	SocWB	-.62***	-.54***	-.49***	-.58***	-.50***	-.41***	-.48***	.73***	1	-
10	EmoWB	-.75***	-.72***	-.67***	-.60***	-.51***	-.53***	-.67***	.76***	.66***	1
	<i>M</i> (<i>SD</i>), T1 (<i>N</i> =401)	2.58 (0.58)	2.61 (0.71)	2.52 (0.78)	2.45 (0.69)	2.30 (0.58)	3.01 (0.66)	21.20 (17.23)	-	-	-
	<i>M</i> (<i>SD</i>), T2 (<i>N</i> =380)	2.57 (0.60)	2.60 (0.74)	2.48 (0.77)	2.47 (0.73)	2.33 (0.60)	2.95 (0.70)	-	21.07 (4.16)	16.74 (3.66)	13.91 (3.25)
	α (ω) for T1	.884 (.880)	.896 (.895)	.789 (.784)	.780 (.778)	.721 (.710)	.555 (.554)	.961 (.959)	-	-	-
	α (ω) for T2	.909 (.904)	.898 (.897)	.794 (.788)	.849 (.842)	.768 (.758)	.600 (.597)	-	.865 (.867)	.798 (.800)	.888 (.895)
	Test–retest	.86***	.76***	.84***	.79***	.75***	.77***	-	-	-	-

Below diagonal line shows the correlations among demoralization and depression measured at Time 1 and well-being measured at Time 1 and well-being measured at Time 2. Above diagonal line shows the correlations among demoralization and well-being measured at Time 2 and depression measured at Time 1

Demoral Demoralization, *Meaning* life meaning, *Helplessness* loneliness and helplessness, *Assurance* self-assurance, *Bravery* bravery and perseverance, *Emotion* emotional distress, *PsyWB* psychological well-being, *SocWB* social well-being, *EmoWB* well-being, *M* mean, *SD* standard deviation, *T1* Time 1, *T2* Time 2; α Cronbach alpha coefficient; ω McDonald omega coefficient, *Test–retest* Test–retest reliability.

*** $p < .001$

Table 5 Regression results for well-being

Psychological well-being						
	Step 1			Step 2		
	B	SE	β	B	SE	β
(Constant)	23.899	0.282	-	35.192	0.786	-
Depression	-0.133***	0.010	-0.554	-0.009	0.012	-0.037
Demoral	-	-	-	-5.388***	0.360	-0.725
R ²	0.307			0.566		
F	167.397***			245.461***		
ΔR^2	-			0.259		
Social Well-being						
	Step 1			Step 2		
	B	SE	β	B	SE	β
(Constant)	18.889	0.262	-	26.604	0.824	-
Depression	-0.101***	0.010	-0.478	-0.016	0.012	-0.077
Demoral	-	-	-	-3.681***	0.377	-0.563
R ²	0.229			0.384		
F	112.023***			117.646***		
ΔR^2	-			0.156		
Emotional Well-being						
	Step 1			Step 2		
	B	SE	β	B	SE	β
(Constant)	16.576	0.197	-	23.274	0.593	-
Depression	-0.125***	0.007	-0.668	-0.052***	0.009	-0.276
Demoral	-	-	-	-3.196***	0.271	-0.550
R ²	0.446			0.595		
F	304.662***			277.309***		
ΔR^2	-			0.149		

Demoral: Demoralization

*** $p < .001$

Nevertheless, there remain several limitations that should be given attention to in future studies. First, the DS-M-15 only applies to people who can read Mandarin. To expand the application of the scale to other cultural groups, the scale needs to be translated into other languages. Second, although results from both adolescents and young adults support the 15-item version, it is worth to note that both studies used the 25 items for model comparison purposes. There is a possibility that participants' responses (to the 15 items) may be confounded by the other items. Hence, future researchers are urged to use the 15 items and examine psychometric properties of the scale. Doing so may also offer insights into the low internal consistency of the emotion subscale. Finally, the present research did not test measurement invariance of the DS-M-15 between the two gender groups as well as age groups. Even though the collected data enable us to carry out the test, as mentioned above, we are concerned that the responses extracted from the 25 items may confound the results. Future researchers are thus suggested to

employ the 15 items and investigate measurement equivalent of the scale for gender and age groups done in different language versions whenever possible.

Conclusively, the DS-M-15 demonstrates encouraging properties thus serves as a promising tool for assessing demoralization among Chinese adolescents and young adults.

Author Contributions All authors contributed to the study conception and design. Material preparation, data collection and analysis were performed by Chuan-Yung Huang, Yi-Chun Hung, Chee-Seng Tan, and Shun-Hao Hu. The first draft of the manuscript was written by Chuan-Yung Huang, Yi-Chun Hung, Chee-Seng Tan, and Siew-May Cheng; Chee-Seng Tan, Siew-May Cheng, and Shun-Hao Hu commented on previous versions of the manuscript. All authors read and approved the final manuscript.

Data Availability The datasets generated during and/or analysis during the present study are available from the corresponding author on request.

Declarations

Ethical Approval All procedures adopted were in accordance with the ethical standards of the responsible committee on human experimentation (institutional and national) and with the Helsinki Declaration of 1975, as revised in 2000 (5). Following the practice of the university, approval was obtained from a group of examiners consisting of the first author and two external examiners.

Consent to Participate Informed consent was obtained from all individual participants and their parents included in the study.

Conflict of Interest The authors have no conflicts of interest to declare that are relevant to the content of this article.

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