

Original Article

Positive self-talk as a protective factor in the relationship between perceived stress and depressive symptoms among Myanmar migrant workers: A cross-sectional study

Mi M. Maung¹, Tinakon Wongpakaran^{1,2*}, Peerasak Lertrakarnnon^{1,3}, Shirley Worland⁴, Nahathai Wongpakaran^{1,2} and Justin DeMaranville¹

¹Mental Health Program, Multidisciplinary and Interdisciplinary School, Chiang Mai University, Chiang Mai, Thailand; ²Department of Psychiatry, Faculty of Medicine, Chiang Mai University, Chiang Mai, Thailand; ³Department of Family Medicine, Faculty of Medicine, Chiang Mai University, Thailand; ⁴Faculty of Health Sciences, University of New England, Armidale, Australia

*Corresponding author: tinakon.w@cmu.ac.th

Abstract

Myanmar migrant workers in Thailand experience multiple migration-related stressors that may increase their vulnerability to depressive symptoms. Positive self-talk may support coping and has been associated with lower depressive symptoms, but evidence on the role of self-talk loudness remains limited. This study examined whether positive self-talk frequency and loudness were associated with depressive symptoms among Myanmar migrant workers in Chiang Mai, Thailand, after accounting for sociodemographic factors, perceived stress, and personality traits. A cross-sectional study was conducted among Myanmar migrant workers aged 20–58 years. Participants completed validated self-report measures of depressive symptoms, perceived stress, personality traits, and positive self-talk frequency and loudness. Hierarchical multiple regression was conducted in four blocks: sociodemographic variables, perceived stress, personality traits, and positive self-talk frequency and loudness. A total of 204 migrant workers were included. Sociodemographic variables explained 8.1% of the variance in depressive symptoms ($R^2=0.081$, $p=0.008$). The addition of perceived stress significantly improved the model ($\Delta R^2=0.213$, $p<0.001$), followed by personality traits ($\Delta R^2=0.106$, $p<0.001$). Positive self-talk frequency and loudness contributed further incremental variance ($\Delta R^2=0.107$, $p<0.001$), resulting in a final model that explained 50.7% of the variance in depressive symptoms ($R^2=0.507$, adjusted $R^2=0.471$). In the final model, perceived stress ($\beta=0.226$, $p=0.001$) and neuroticism ($\beta=0.340$, $p<0.001$) were positively associated with depressive symptoms, whereas positive self-talk frequency ($\beta=-0.292$, $p<0.001$) and self-talk loudness ($\beta=-0.152$, $p=0.011$) were negatively associated with depressive symptoms. These findings suggest that positive self-talk frequency and loudness provide additional explanatory value beyond perceived stress and personality traits and may represent relevant cognitive correlates of depressive symptoms among Myanmar migrant workers.

Keywords: Myanmar migrant workers, depressive symptoms, perceived stress, positive self-talk, neuroticism

Introduction

Migration can contribute to national and local economic development, yet for many individuals it also involves substantial psychosocial challenges. Migrant workers often face cultural adjustment demands, language barriers, discrimination, insecure employment, and reduced opportunities for stable social connections, all of which may undermine psychological well-being



[1]. Thailand is one of the primary destinations for migrants from Myanmar, and the International Organization for Migration (IOM) in 2025 estimated that more than four million Myanmar nationals live in Thailand, comprising documented workers, undocumented migrants, and refugees [2]. Northern provinces such as Chiang Mai have become important receiving areas because of geographic proximity and employment opportunities. However, the benefits of migration are frequently accompanied by structural constraints, including difficult working conditions, limited access to health services, legal vulnerability, and communication barriers. In this context, migrant workers may experience elevated mental health burden, with depressive symptoms representing a particularly salient concern [3]. Evidence suggests that the accumulation of migration-related stressors is significantly associated with higher levels of depression [4]. Since depression is a leading contributor to disability worldwide, understanding modifiable and culturally feasible protective factors for depression among Myanmar migrant workers in Thailand is a public health priority.

One psychological mechanism linking adverse life circumstances to depressive symptoms is perceived stress, which refers to the degree to which individuals appraise situations in their lives as stressful, unpredictable, or overwhelming [5]. Perceived stress is not merely the presence of external stressors; rather, it reflects an individual's evaluation of demands relative to available coping resources. Higher perceived stress is reliably associated with greater depressive symptoms [6]. For migrant workers, perceived stress may be amplified by precarious employment, separation from family, financial responsibilities, and uncertainty about legal status. At the same time, migrants exposed to similar objective stressors can show markedly different levels of psychological distress. This variability implies that individual differences can shape how stress is interpreted and managed.

Among these individual differences, personality traits are consistently related to depressive symptoms because they influence emotional reactivity, threat sensitivity, and coping tendencies. Neuroticism—characterized by emotional instability, heightened sensitivity to negative events, and frequent experience of negative affect—is one of the most robust personality risk factors for depression [7]. Migrant workers with higher neuroticism may be more likely to perceive stressful situations as overwhelming, experience stronger negative emotions under pressure, and engage in cognitive patterns that maintain psychological distress. Beyond neuroticism, broader personality profiles may also be relevant. Therefore, the present study considered the five Zuckerman, Kuhlman, and Aluja (ZKA) personality dimensions: extraversion, neuroticism, activity, aggression, and sensation seeking. These traits were included because social orientation, emotional sensitivity, energetic engagement, confrontational tendencies, and novelty-seeking preferences may shape both stress experiences and mental health outcomes.

Sociodemographic factors provide additional context for understanding mental health among migrants. Variables such as gender, age, marital status, education, and income can influence exposure to stressors and access to resources, potentially shaping perceived stress and depressive symptoms [1]. Younger workers may have less job stability, education may affect access to safer or higher-paying jobs, and lower income can intensify financial pressure [1]. Migration experiences are also heterogeneous across occupational sectors and living arrangements, which can affect daily stress exposure. While sociodemographic characteristics do not fully explain psychological outcomes, they represent important covariates when evaluating the incremental contribution of stress, personality, and coping-related cognitive predictors.

A coping-related process that may be particularly relevant for migrants is self-talk, defined as the internal dialogue people engage in either automatically or deliberately [8]. Self-talk can guide attention, influence emotional reactions, and shape behavior in demanding situations. Cognitive models of depression emphasize that habitual negative interpretations and self-evaluations can contribute to depressed mood and withdrawal [9]. Consistent with this view, negative self-talk can often be referred to as self-attacking, self-neglecting, self-blaming, and self-controlling [10]. In contrast, positive self-talk may function as an adaptive coping strategy by supporting cognitive reappraisal, emotion regulation, and persistence under stress [11]. In contexts where external resources may be constrained—as is often the case for migrant workers—positive self-talk may serve as an accessible and low-cost internal coping tool [12].

Self-talk is also shaped by relatively stable individual differences, including personality traits. Personality can influence how individuals habitually interpret events and the types of internal dialogues they generate under stress [13]. For example, individuals higher in neuroticism may be more prone to repetitive worry and self-critical thinking, whereas traits such as activity or extraversion may support more approach-oriented, encouraging internal dialogue [7]. Therefore, when examining whether positive self-talk is associated with depressive symptoms, it is important to consider personality traits to clarify whether self-talk contributes unique explanatory value beyond dispositional tendencies that may predispose individuals toward particular self-talk styles.

Positive self-talk can be described not only by its content, but also by how it is experienced and enacted. One basic dimension is frequency, or how often individuals use positive self-talk in response to stressors. Frequency captures the extent to which positive self-talk is a habitual coping response and, therefore, may be particularly relevant to mental health outcomes. Another dimension concerns how self-talk is expressed, including phenomenological qualities such as loudness/volume—ranging from no vocalization (purely internal dialogue) to speaking aloud at varying intensities. In this present study, self-talk loudness is conceptualized as a secondary characteristic of positive self-talk that may reflect the degree to which self-talk is externally expressed or experienced as more salient or forceful. Louder self-talk might capture attention more easily, one's own and others, as a larger expression of one's inner world. Consequently, it could affect emotional functioning and depressive symptoms differently than quiet inner self-talk. Thus, the loudness of self-talk may represent an extra phenomenological component of internal communication that goes beyond content or frequency. Although some self-talk research has examined form and delivery, the mental health relevance of loudness has received less attention than frequency or valence. Consequently, loudness warrants investigation, particularly in populations where speaking aloud to oneself may be shaped by cultural norms, workplace context, and privacy constraints.

Despite growing interest in self-talk, an important gap remains regarding how the frequency and loudness of positive self-talk are associated with depressive symptoms across different population groups. This gap is particularly relevant for migrant workers, whose self-talk may occur in the context of prolonged and complex stress exposure. Much of the existing evidence on self-talk has been generated in sport, academic, and performance settings, where stressors are often more situational or time-limited. These findings may not be directly generalizable to migrant workers, who frequently face chronic stressors that affect multiple aspects of life, including employment, financial security, social support, cultural adaptation, and separation from family. In addition, although the frequency of self-talk has received some attention, evidence on self-talk loudness remains limited. This leaves open the question of whether the loudness of positive self-talk contributes uniquely to depressive symptoms. Previous research on acoustic speech features has shown that vocal loudness is one of several features that consistently differ between healthy individuals and those with depression across multiple speech scenarios [14]. This suggests that loudness may carry meaningful information related to depressive states. However, whether this finding extends to the loudness of self-directed speech remains largely unexplored. Addressing these gaps is important for both theory and practice. Theoretically, it may help clarify the relative roles of stress appraisal, personality sensitivity, and coping-related cognition in depressive symptoms. Practically, positive self-talk may represent a brief, scalable, and low-cost intervention target, including in resource-limited settings. Therefore, the present study examines positive self-talk as a coping-related explanatory factor that may have distinct associations with depressive symptoms beyond stress appraisal and personality sensitivity.

Accordingly, the aim of this study was to examine depressive symptoms among Myanmar migrant workers in Chiang Mai, Thailand, focusing on the predictive roles of sociodemographic characteristics, perceived stress, ZKA personality traits, and positive self-talk (frequency and loudness) – with particular interest in the independent contribution of positive self-talk within a hierarchical framework. Positive self-talk was conceptualized as a coping characteristic, capable of uniquely predicting depressive symptoms independently from personality and perceived stress. Therefore, self-talk was treated as a direct predictor rather than a mediator or moderator of the stress-depression relationship. A hierarchical regression approach was used to evaluate

whether positive self-talk explains additional variance in depressive symptoms beyond established risk factors. This blockwise approach reflects the study's conceptual sequence: sociodemographic context, current stress appraisal, relatively stable personality dispositions, and coping-related self-talk characteristics.

Methods

Study design and setting

A cross-sectional study was conducted between December 2025 and March 2026 among Myanmar migrant workers residing and employed in Chiang Mai Province, Northern Thailand. Chiang Mai is a major destination for migrant labor due to its expanding construction, manufacturing, and service sectors, and hosts a large Myanmar migrant community. Recruitment was carried out in workplaces, community centers, and migrant support organizations to ensure coverage of diverse employment and living contexts. The setting reflects typical migration-related stressors, including precarious employment, limited social protection, and cultural adaptation challenges, making it an appropriate context for examining psychosocial correlates of depressive symptoms.

Participants and criteria

This study included migrant workers aged 20 years or older who were able to read, write, and understand Burmese and had lived and worked in Chiang Mai, Thailand, for at least 6 months. Individuals with severe psychiatric conditions or cognitive disabilities that could affect their ability to provide informed consent were excluded. Tourists were also excluded. No formal diagnostic screening was conducted.

Sample size and sampling method

The sample size was calculated using G*Power 3.1 based on a linear multiple regression model (fixed model, R^2 deviation from zero), assuming an effect size (f) of 0.15, $\alpha=0.05$, and power =0.90. The estimated minimum required sample size was 162. In this study, 204 participants were included in the analysis. A convenience sampling method was employed, whereby participants were recruited based on availability and willingness to participate rather than random selection. Myanmar migrant workers were approached in workplaces, community centers, and migrant support organizations in Chiang Mai Province. This approach enabled access to a diverse group within practical constraints and facilitated feasibility in a hard-to-reach population.

Study procedure and data collection

Participants were invited through both online and on-site approaches. The study invitation was disseminated online through social media platforms, including Facebook, Messenger, and Signal, and participants who agreed to take part completed the questionnaire remotely using Microsoft Forms. For on-site data collection, non-governmental organizations (NGOs), restaurants, factories, and religious venues across Chiang Mai were contacted to obtain permission to distribute the questionnaire. Each site received the ethics approval letter, participant information sheet, informed consent form, compensation receipt, and Burmese-language self-administered questionnaire before data collection. On-site data collection was also conducted at selected temples and meditation centers on scheduled dates. All participants provided informed consent before completing the questionnaire. Data were collected at a single time point using either an online or paper-based questionnaire. The questionnaire collected sociodemographic information, including age, sex, education, monthly income, marital status, and living situation. It also included standardized instruments assessing depressive symptoms, positive self-talk, perceived stress, and personality.

Translation and cultural adaptation of study instruments

The study questionnaire was administered in Burmese. Instruments without an existing Burmese version including the Outcome Inventory 21 (OI-21), the Positive Self-Talk Inventory (PSTI), the Perceived Stress Scale-10 (PSS-10), and the Zuckerman, Kuhlman, and Aluja Personality

Questionnaire Short Form (ZKA-20) were translated from English into Burmese by the first author and a professional translator from the Language Institute, Chiang Mai University, who had expertise in the Burmese language. An independent bilingual translator from the same institute then back-translated the Burmese versions into English. The original, translated, and back-translated versions were reviewed by the first author and two co-authors (TW and NW) to identify any discrepancies. Any differences were resolved through discussion and revision. The final Burmese versions were prepared to preserve the conceptual meaning of the original instruments while ensuring linguistic and cultural appropriateness for Burmese migrant workers living in Thailand.

Study instruments and variables

Outcome Inventory 21 (OI-21)

OI-21 measures anxiety, depression, somatization, and interpersonal difficulty. It is a 21-item questionnaire with a 5-Likert-type response scale, from '0', not at all, to '4', almost always, and higher scores indicate greater levels of psychological distress [15]. In the present study, only the subscale of depression was used. The depression subscale of the OI-21 includes five items (2, 5, 14, 18, and 21). The sample of the OI-depression items include the following items: 'I believe that I cannot have a happy life—as others do.' OI has demonstrated good psychometric properties. This study showed excellent reliability (Cronbach's alpha = 0.81).

Positive Self-Talk Inventory (PSTI)

Positive self-talk was assessed using the Positive Self-Talk Inventory (PSTI) developed previously [16]. The PSTI comprises 20 positively worded statements reflecting self-encouragement and supportive self-affirmations. Items include statements such as 'I am stronger than I think' and 'I have overcome challenges before, and I can do it again'. For each item, participants rated (a) frequency on a 5-point scale (0 = never to 4 = always; total score range = 0–80) and (b) loudness on a 6-point scale (1 = no vocalization/internal only to 6 = very loud/shouting; total score range of 20–120). Frequency and loudness total scores were analyzed separately to capture distinct characteristics of positive self-talk (usage vs expression) and to examine their unique associations with depressive symptoms. In the present sample, internal consistency was excellent for both subscales (frequency: Cronbach's alpha = 0.96; loudness: Cronbach's alpha = 0.97), with the high loudness coefficient indicating highly homogeneous item responses.

Burmese version of the Perceived Stress Scale (PSS-10)

PSS-10, a 10-item instrument that measures the degree to which life events are perceived as being stressful [17]. This is a 5-point Likert scale instrument. Each item on the PSS-10 was scored on a 5-point Likert scale, ranging from 0 (never) to 4 (very often). Higher scores indicate higher levels of perceived stress. In this study, Cronbach's alpha for the PSS-10 was 0.85.

Zuckerman, Kuhlman, and Aluja Personality Questionnaire (ZKA-20)

ZKA-20, developed by Zuckerman, Kuhlman, and Aluja, adheres to the Alternative Five-Factor Model (AFFM) to evaluate five key personality traits: extraversion, neuroticism, activity, aggression, and sensation seeking [18]. In this study, the Burmese version ZKA-20 including 20 items with each trait represented by four specific items, was used. Responses were assessed on a four-point Likert scale ranging from 1 (strongly disagree) to 4 (strongly agree), where higher scores reflect stronger expression of the related personality trait. Prior to computing the total score, items 14, 15, 17, and 18 were reversed. The scale has shown sufficient internal consistency across its five personality dimensions, with Cronbach's alpha reliability coefficients supporting its validity and dependability for research purposes [19]. In this study, the Cronbach's alpha of each subscale was (0.794), (0.725), (0.705), (0.766), and (0.744), for extraversion, neuroticism, activity, aggression, and sensation seeking, respectively.

Statistical analyses

Descriptive statistics (means, standard deviations, frequencies, and percentages) were computed to summarize participants' sociodemographic characteristics and study variables. Internal consistency reliability for each instrument was evaluated using Cronbach's alpha.

Correlations among scores of depression, perceived stress, positive self-talk, and personality traits were assessed using Pearson correlations. To assess the incremental contribution of positive self-talk to depressive symptoms, hierarchical multiple regression was performed. Prior to analysis, regression assumptions were evaluated. Linearity and homoscedasticity were assessed using scatterplots of standardized residuals against standardized predicted values. Normality of residuals was examined using histograms and normal P-P plots. Independence of errors was checked using the Durbin-Watson statistic (values between 1.5 and 2.5 indicating acceptable independence). Multicollinearity was evaluated using tolerance (values < 0.10 indicating concern) and variance inflation factor (VIF; values > 5 indicating concern). Potential outliers and influential cases were screened using standardized residuals (± 3), Mahalanobis distance ($p < 0.001$), and Cook's distance (> 1.0). Predictors were entered in four blocks: sociodemographic variables (Block 1), perceived stress (Block 2), personality traits (Block 3), and positive self-talk frequency and loudness (Block 4). Model fit was evaluated using R^2 and change in R^2 at each step. Statistical significance was set at $p < 0.05$ for all tests. All statistical analyses were conducted in SPSS version 27 (IBM, New York, USA).

Results

Characteristics of the participants

A total of 204 participants were included, and their characteristics are presented in **Table 1**. The sample included a slightly higher proportion of males and singles, with most having completed high school or holding a degree. The majority reported monthly income in the lowest income category and lived with others. Nearly all participants reported having documented legal status in Thailand (**Table 1**).

Table 1. Sociodemographic characteristics of Myanmar migrant workers in Chiang Mai (n=204)

Variables	Frequency (%)
Sex	
Male	114 (55.9)
Female	90 (44.1)
Marital status	
Single	163 (79.9)
Married	40 (19.6)
Widowed	1 (0.5)
Level of education	
Elementary	4 (2.0)
Middle school	24 (11.8)
High school	92 (45.1)
Diploma	16 (7.8)
Degree	68 (33.3)
Monthly income (Thai Baht)	
0–10,000	121 (59.3)
10,000–20,000	63 (30.9)
20,000–30,000	12 (5.9)
30,000 or more	8 (3.9)

Levels of depression, perceived stress, positive self-talk and personality

Participants reported moderate levels of depressive symptoms and perceived stress (**Table 2**). Positive self-talk scores were generally in the midrange for both frequency and loudness. Among the personality dimensions, activity and extraversion had relatively higher scores; neuroticism and aggression showed moderate scores, and sensation seeking had the lowest score. Most measured variables were approximately normally distributed, although sensation seeking showed the clearest deviation from normality (**Table 2**).

Table 2. Levels of depression, perceived stress, positive self-talk and personality scores

Variable	Min-max	Mean±SD	Skewness	Kurtosis
OI-depression	0–15	6.04±3.8	0.231	-0.679
PSTI-F	23–80	55.13±15.5	0 -0.038	-1.076
PSTI-L	20–120	64.58±28.9	0.031	-1.202
Perceived stress (PSS-10)	0–40	18.39±6.5	0.380	1.481
ZKA personality				
Neuroticism	4–16	10.87±2.4	-0.684	0.409
Extraversion	4–16	12.66±2.6	-0.078	0.318
Activity	4–16	13.10±2.4	-0.686	0.257
Aggression	4–16	10.44±2.5	0.047	-0.070
Sensation seeking	4–16	7.18±2.7	0.928	1.087

PSS-10: Perceived Stress Scale; PSTI-F: Positive Self Talk Inventory-Frequency Subscale; PSTI-L: Positive Self Talk Inventory-Loudness Subscale; SD: standard deviation

Correlation between scores of depression, perceived stress, positive self-talk and personality trait

Correlations between depression, perceived risk, positive self-talk, and personality trait scores are presented in **Table 3**. The correlation analysis showed that perceived stress was positively associated with depressive symptoms, while positive self-talk frequency was negatively associated with depressive symptoms. Neuroticism was positively associated with depressive symptoms, whereas other personality traits showed weaker or non-significant associations with depressive symptoms. Perceived stress was also positively associated with neuroticism and negatively associated with both positive self-talk frequency and loudness. Positive self-talk frequency was positively associated with loudness, suggesting that participants who used positive self-talk more often also tended to experience or express it more loudly. In addition, positive self-talk frequency was negatively associated with neuroticism and aggression, while positive self-talk loudness showed weaker associations with personality traits. Age was negatively associated with depressive symptoms and perceived stress, and positively associated with positive self-talk frequency, indicating that older participants tended to report fewer depressive symptoms, lower stress, and more frequent positive self-talk. Overall, the strongest and most consistent psychological correlates of depressive symptoms were perceived stress, neuroticism, and positive self-talk frequency (**Table 3**).

Regression assumption testing and final analytic sample

All statistical assumptions for hierarchical multiple regression were satisfactorily met. Of the 204 participants initially included in the study, 11 cases were removed after screening for univariate and multivariate outliers, resulting in a final analytic sample of 193 participants. This sample size exceeded the minimum required sample of 162 participants based on the a priori power analysis. Multicollinearity was not observed, with VIF values ranging from 1.152 to 2.566, all below the threshold of 5, and tolerance values ranging from 0.390 to 0.868, all above 0.20. The residuals were approximately normally distributed, with a mean standardized residual close to zero ($M=-2.51E-16$, $SD=0.965$) and standardized residuals ranging from -2.677 to 2.926, indicating no extreme outliers beyond ± 3 . Linearity and homoscedasticity were supported by visual inspection of the scatterplot of standardized predicted values against standardized residuals, which showed a random distribution of points around zero without funneling or curvilinear patterns. The Durbin-Watson statistic was 1.865, indicating acceptable independence of residuals. Therefore, the regression results were considered valid and interpretable.

Hierarchical regression analysis of factors associated with depressive symptoms

The hierarchical multiple regression analysis examining factors associated with OI-depression across four steps are presented in **Table 4**. In Step 1, sociodemographic variables, including age, gender, marital status, education, and income, explained 8.1% of the variance in OI-depression ($R^2=0.081$, adjusted $R^2=0.056$). Age was the only significant variable associated with OI-depression ($B=-0.120$, $p=0.036$, 95%CI: -0.232 to -0.008).

Table 3. Correlation matrix among age, depressive symptoms, positive self-talk, perceived stress, and personality traits

Items	1	2	3	4	5	6	7	8	9	10
1. Age	-									
2. OI-depression	-0.170*	-								
3. PSTI-F	0.157*	-0.451**	-							
4. PSTI-L	0.025	-0.185**	0.310**	-						
5. Perceived stress (PSS-10)	-0.249**	0.507**	-0.407**	-0.151*	-					
6. Neuroticism	0.088	-0.092	0.215**	0.149*	-0.115	-				
7. Extraversion	-0.091	0.449**	-0.249**	-0.096	0.491**	0.101	-			
8. Activity	0.017	-0.102	0.238**	0.109	0.183**	0.693**	0.083	-		
9. Aggression	-0.033	0.282**	-0.204**	0.012	0.388**	0.103	0.692**	0.100	-	
10. Sensation seeking	-0.118	-0.059	-0.123	-0.194**	0.072	-0.545**	-0.183**	-0.703**	-0.107	-

PSS-10: Perceived Stress Scale; PSTI-F: Positive Self Talk Inventory-Frequency Subscale; PSTI-L: Positive Self Talk Inventory-Loudness Subscale

* Statistically significant at $p < 0.05$

** Statistically significant at $p < 0.01$

In Step 2, perceived stress was added and increased the explained variance to 29.4% ($R^2=0.294$, adjusted $R^2=0.271$), with an additional 21.3% of variance explained ($\Delta R^2=0.213$). Perceived stress was positively associated with OI-depression ($B=0.280$, $p<0.001$, 95%CI: 0.205–0.355) (**Table 4**). In Step 3, personality traits were entered, increasing the explained variance to 40.0% ($R^2=0.400$, adjusted $R^2=0.363$), with an additional 10.6% of variance explained ($\Delta R^2=0.106$) (**Table 4**). Neuroticism was positively associated with OI-depression ($B=0.622$, $p<0.001$, 95%CI: 0.364–0.881), while perceived stress remained significant ($B=0.173$, $p<0.001$, 95%CI: 0.090–0.256). In Step 4, positive self-talk frequency and loudness were added, increasing the explained variance to 50.7% ($R^2=0.507$, adjusted $R^2=0.471$), with an additional 10.7% of variance explained ($\Delta R^2=0.107$) (**Table 4**). Both positive self-talk frequency ($B=-0.069$, $p<0.001$, 95%CI: -0.099 to -0.039) and loudness ($B=-0.019$, $p=0.011$, 95%CI: -0.033 to -0.004) were negatively associated with OI-depression. In the final model, perceived stress and neuroticism remained significantly positively associated with OI-depression, whereas positive self-talk frequency and loudness remained significantly negatively associated (**Table 4**). Other sociodemographic and personality variables were not significantly associated with OI-depression in the final model (**Table 4**).

Table 4. Hierarchical multiple regression analysis predicting depression (n=193)

Step	Predictor	OI-depression			
		R^2 adj	R^2 change	B	p-value (95%CI)
1		0.056	0.081		
	Age			-0.120	0.036 (-0.232, -0.008)
	Gender (female)			0.733	0.160 (-0.293, 1.759)
	Marital status (single)			-0.595	0.432 (-2.084, 0.894)
	Education (high school or lower)			-0.404	0.462 (-1.485, 0.677)
	Income (≤ 10000 Baht)			1.040	0.061 (-0.049, 2.130)
2		0.271	0.213		
	Age			-0.052	0.308 (-0.152, 0.048)
	Gender (female)			0.255	0.582 (-0.656, 1.166)
	Marital status (single)			-0.565	0.395 (-1.874, 0.743)
	Education (high school or lower)			-0.384	0.426 (-1.334, 0.566)
	Income (≤ 10000 Baht)			0.681	0.164 (-0.281, 1.644)
	PSS			0.280	0.000 (0.205, 0.355)
3		0.363	0.106		
	Age			-0.044	0.358 (-0.140, 0.051)
	Gender (female)			0.645	0.148 (-0.230, 1.520)
	Marital status (single)			-0.616	0.329 (-1.858, 0.625)
	Education (high school or lower)			-0.246	0.606 (-1.189, 0.696)
	Income (≤ 10000 Baht)			0.661	0.151 (-0.243, 1.566)
	PSS			0.173	0.000 (0.090, 0.256)
	Extraversion			-0.143	0.216 (-0.371, 0.084)
	Neuroticism			0.622	0.000 (0.364, 0.881)
	Activity			-0.078	0.607 (-0.379, 0.222)
	Aggression			-0.142	0.217 (-0.368, 0.084)
	Sensation seeking			-0.107	0.343 (-0.331, 0.116)
4		0.471	0.107		
	Age			-0.043	0.340 (-0.132, 0.046)
	Gender (female)			0.324	0.428 (-0.480, 1.128)
	Marital status (single)			-0.726	0.213 (-1.873, 0.420)
	Education (high school or lower)			-0.488	0.272 (-1.360, 0.385)
	Income (≤ 10000 Baht)			0.646	0.127 (-0.187, 1.480)
	PSS			0.132	0.001 (0.055, 0.208)
	Extraversion			-0.034	0.754 (-0.244, 0.177)
	Neuroticism			0.513	0.000 (0.274, 0.752)
	Activity			-0.042	0.764 (-0.321, 0.236)
	Aggression			-0.140	0.190 (-0.351, 0.070)
	Sensation seeking			-0.123	0.248 (-0.331, 0.086)
	PSTI-Frequency			-0.069	0.000 (-0.099, -0.039)
	PSTI- Loudness			-0.019	0.011 (-0.033, -0.004)

B: unstandardized coefficients; PSS: Perceived Stress Scale; PSTI-F: Positive Self Talk Inventory-Frequency Subscale; PSTI-Loudness: Positive Self Talk Inventory-Loudness Subscale

* Statistically significant at $p<0.05$

** Statistically significant at $p<0.01$

*** Statistically significant at $p<0.001$

Discussion

This study examined whether positive self-talk characteristics (frequency and loudness) are associated with depressive symptoms among Myanmar migrant workers in Chiang Mai, Thailand, after accounting for sociodemographic factors, perceived stress, and personality traits. The findings underscore the potential relevance of self-talk as a modifiable coping process in a population exposed to multiple migration- and work-related stressors. The final hierarchical regression model accounted for a fairly large part of variance in depressive symptoms ($R^2=0.507$, adjusted $R^2=0.471$). As expected, perceived stress and personality traits contributed significantly to the model. Importantly, adding positive self-talk frequency and loudness produced a meaningful incremental increase in explained variance ($\Delta R^2=0.107$).

Perceived stress was a consistent positive predictor of depressive symptoms across models. This finding aligns with stress appraisal frameworks and prior evidence showing that individuals who perceive life demands as overwhelming are more likely to report depressive symptoms [20–22]. For migrant workers, perceived stress may reflect multiple ongoing pressures (e.g., job insecurity, financial demands, language barriers, and limited access to services) [23]. Practically, this underscores the potential benefit of interventions that reduce perceived stress through skills such as problem-solving, relaxation, and cognitive reappraisal, as well as structural supports that reduce daily stressors.

Neuroticism showed a significant positive association with depressive symptoms in the final model. This is consistent with extensive literature identifying neuroticism as a stable vulnerability factor related to heightened emotional reactivity, negative affectivity, and sensitivity to stress [24]. In the migration context, individuals high in neuroticism may experience more intense distress in response to challenges such as discrimination or unstable employment, and may also engage in cognitive patterns (e.g., worry, threat-focused attention) that maintain negative mood.

A key contribution of this study is that positive self-talk frequency emerged as a significant negative predictor of depressive symptoms even after accounting for sociodemographic factors, perceived stress, and personality traits. This may suggest that positive self-talk frequency could function as a potential protective factor (or protective correlate) associated with fewer depressive symptoms, consistent with conceptualizations of self-talk as an adaptive self-regulatory strategy that shapes emotional and behavioral responses [12]. In practical terms, more frequent positive self-talk may indicate greater use of encouraging self-instructions, self-compassionate statements, or optimistic reframing, which may facilitate cognitive reappraisal and emotion regulation and thereby reduce vulnerability to depressive symptoms [25]. These forms of self-talk are situated in cognitive behavioral theory, resilience frameworks, and emotional regulation behaviors relevant to depression treatment. Importantly, the incremental contribution of self-talk frequency beyond perceived stress suggests that, even at higher levels of perceived stress, individuals who report using positive self-talk more often also report fewer depressive symptoms [26]. Although causal direction cannot be established from this cross-sectional design, these findings highlight self-talk frequency as a potentially modifiable target for brief, scalable interventions (e.g., structured self-talk training, cognitive restructuring, or self-compassion exercises), which may be particularly feasible for migrant workers who face barriers to accessing mental health services [27].

In addition to frequency, self-talk loudness emerged as a significant negative predictor of depressive symptoms. Although empirical evidence specifically addressing loudness is limited, this finding suggests that the form or salience of positive self-talk may be relevant, consistent with broader conceptualizations of self-talk as a self-regulatory process that can be enacted internally or externally [8]. One interpretation is that louder self-talk (i.e., closer to overt verbalization) may make coping statements more attention-capturing and easier to implement in the moment, thereby strengthening emotion regulation and persistence under stress [12]. In real-world settings, however, speaking aloud to oneself may be shaped by context (e.g., privacy and workplace norms) and cultural meaning; thus, loudness should not be interpreted as universally beneficial without considering situational constraints. Future studies could clarify whether loudness differs across work settings or living arrangements. Although the sociodemographic block significantly predicted depressive symptoms at the initial step, most individual demographic indicators were no longer significant once perceived stress, personality traits, and

self-talk were entered. This pattern suggests that sociodemographic disparities in depressive symptoms may be explained, at least in part, by more proximal psychological factors, particularly stress appraisal and related coping processes, rather than by demographic characteristics per se [23]. Notably, age was a significant predictor in demographics-only model but became non-significant after perceived stress, and other psychological variables were included, suggesting that demographic correlates of depressive symptoms may operate indirectly through more proximal psychological factors.

These findings have several implications. First, screening efforts for migrant mental health may benefit from assessing perceived stress and neuroticism as risk indicators. Second, because positive self-talk frequency and loudness both showed unique associations, interventions that explicitly train positive self-talk may be a practical approach to influence depressive symptoms, subject to further investigation. Such interventions could be delivered in brief formats, integrated into workplace health promotion, or adapted for community-based organizations serving migrant workers. Importantly, culturally and linguistically appropriate adaptation is essential, including ensuring that self-talk scripts are meaningful in participants' language(s) and aligned with cultural norms regarding emotional expression and speaking aloud.

Several limitations should be noted. The cross-sectional design limits causal interpretation: longitudinal and experimental research is needed to test directionality and mechanisms. In the case of self-talk, it is also possible that people simply talk to themselves more positively when they are feeling better, rather than positive self-talk being the source of their lower depression. The use of convenience sampling may affect generalizability because participants were recruited from social media platforms, NGOs, temples, and other community settings. There are self-selection, literacy, and volunteer biases in the sample. Therefore, the results may not represent those Myanmar migrant workers who are less literate, more socially isolated, undocumented, or disconnected from the community. Future research should evaluate whether self-talk interventions produce symptom reductions, examine potential mediators (e.g., rumination, self-efficacy, reappraisal), and explore contextual moderators such as workplace conditions, legal status, and social support access.

Conclusion

Depressive symptoms among Myanmar migrant workers were strongly associated with higher perceived stress and neuroticism, while positive self-talk frequency and loudness were associated with fewer depressive symptoms beyond these risk factors. Together, these findings highlight positive self-talk as an influential correlate in migrant mental health. Future longitudinal and experimental studies are still needed to determine whether positive self-talk interventions can contribute to reducing the symptoms of depression in this population.

Ethics approval

This study was approved by the Research Ethics Committee, Faculty of Medicine, Chiang Mai University. Research ID: PSY-2568-0461.

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Competing interests

The authors declare that they have no conflicts of interest.

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Underlying data

Derived data supporting the findings of this study are available from the corresponding author on request.

Declaration of artificial intelligence use

We hereby confirm that no artificial intelligence (AI) tools or methodologies were utilized at any stage of this study, including during data collection, analysis, visualization, or manuscript preparation. All work presented in this study was conducted manually by the authors without the assistance of AI-based tools or systems.

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