MUSICAL INVOLVEMENT AND MENTAL HEALTH. A COMPARATIVE STUDY ON WELL-BEING AND EMOTIONAL DISTRESS

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Abstract

The relationship between musical engagement, psychological well-being, and emotional distress has received considerable empirical attention within positive psychology and behavioral sciences. However, findings regarding whether active artistic involvement protects against or increases psychological vulnerability remain unanswered. This study searches for the differences in psychological well-being (measured by the Ryff scale) and emotional distress (measured by the DASS-21 scale: depression, anxiety, and stress) across individuals with different levels of musical engagement, while controlling for key demographic factors. A cross-sectional quantitative design was implemented using an online survey administered to N = 1,237 respondents from Romania (mean age = 24.46 years, SD = 10.81; 70.15% females and 29.85% males). Respondents filled out a set of validated psychological scales assessing emotional distress (DASS-21) and eudaimonic well-being (Ryff scale), plus detailed self-reports of musical involvement (GIM) and playing frequency (PF). Multivariate regressions and analyses of variance showed that general well-being and clinical distress baselines were comparable across active musicians, non-musicians, and intermediate respondents. However, active musicians exhibited significantly higher daily stress levels compared to non-musicians and intermediate groups. Plus, significant gender and age variations appeared across the sample, in line with the mental health literature. To conclude, while music can be a useful tool for emotional coping, high levels of instrumental practice and performance routines are often accompanied by distinctive occupational or self-evaluative stress burdens.

Keywords: musical involvement, psychological well-being, DASS-21, Ryff scale.

INTRODUCTION

The ability of humans to engage with music, going from passive listening to active instrumental performance and vocalization, is strongly connected with emotional expression, social bonding, and lifelong psychological development (Gustavson *et al.*, 2021). In the field of contemporary positive psychology and behavioral psychology, active music-making is often seen as a therapeutic mechanism that helps emotional catharsis, supports community integration, and reinforces eudaimonic flourishing.

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Grounded in Ryff's (1989) multidimensional model of psychological well-being, eudaimonic flourishing emphasizes optimal human functioning across six distinct dimensions: autonomy, environmental mastery, personal growth, positive relations with others, purpose in life, and self-acceptance. Mental health and emotional distress are frequently measured using clinical self-report instruments like the Depression, Anxiety, and Stress Scales (DASS-21), which quantify negative affective states (Lovibond & Lovibond, 1995).

Theoretical mechanisms explaining the positive impact of musical engagement primarily involve neurochemical, cognitive, and social pathways. Active music listening and performance stimulate the dopaminergic mesolimbic circuitry and downregulate the hypothalamic-pituitary-adrenal (HPA) axis, fostering positive affect and mitigating physiological tension (Chanda & Levitin, 2013). At a cognitive-emotional level, musical expression offers non-verbal modalities for emotional catharsis, cognitive reframing, and mood regulation (Saarikallio & Erkkilä, 2007), while collaborative ensemble playing strengthens social cohesion through shared intentionality and interpersonal synchrony (Koelsch *et al.*, 2019).

Conversely, intensive musical engagement can precipitate psychological vulnerability through performance-contingent self-worth, maladaptive perfectionism, and acute evaluative stress (Kenny, 2011). Professional and dedicated instrumentalists regularly encounter rigorous practice schedules, physiological strain, career precarity, and hyper-competitive evaluative environments. Under these conditions, the intrinsic therapeutic value of artistic expression may be supplanted by music performance anxiety (MPA) and chronic occupational distress, demonstrating a non-linear dosage effect wherein high dedication introduces unique stressors absent in casual participation (Jäncke, 2008; Zhang *et al.*, 2025).

Although extensive research documents the benefits of artistic expression, the psychological profile of musicians and individuals with high musical involvement has many facets (Granot *et al.*, 2021). While casual and amateur involvement often correlates with positive psychological outcomes, intensive musical training, rigorous performance demands, and competitive artistic lifestyles can also expose individuals to heightened stress, chronic perfectionism, and music performance anxiety (Jäncke, 2008; Zhang *et al.*, 2025). Contemporary literature highlights a persistent theoretical and empirical dichotomy: music functions simultaneously as a psychological buffer against emotional distress and as a specialized domain characterized by distinct occupational pressures that can increase vulnerability (Román, 2022).

Furthermore, individual differences such as age, gender, and educational attainment heavily modulate baseline mental health outcomes across the general population. Many epidemiological and psychological studies confirm that internalizing symptoms, particularly anxiety and perceived stress, differ systematically across demographic lines, with female cohorts frequently reporting higher symptom loads on standardized clinical screening tools (Diener *et al.*, 2018). However, it is very important to evaluate whether these established

demographic trends are moderated, attenuated, or preserved when controlling for active involvement in creative disciplines.

To address these theoretical gaps, the present study investigates the structural interplay between musical engagement, socio-demographic factors, emotional distress (measured via the DASS-21), and eudaimonic well-being (measured via the Ryff scale). To tackle the main objectives of this study, five specific research hypotheses were formulated, each anchored in psychological literature. To bridge these theoretical tensions, the overarching research question guiding this investigation is: to what extent does active, intensive musical involvement function as a resource for eudaimonic flourishing versus an occupational vector for emotional distress, when evaluated against socio-demographic baselines and behavioral dosage tiers? From this central question, five coherent and empirically testable hypotheses logically derive:

Hypothesis 1 (H1): Socio-demographic factors (age, education level, and marital status) will significantly predict psychological well-being and symptom severity of depression, anxiety, and stress, with advancing age acting as a protective factor against emotional distress. Grounded in lifespan developmental models and subjective well-being research, socio-demographic indicators are established determinants of emotional regulation and life evaluation, with advancing age consistently associated with greater emotional stability and declining negative affect (Diener *et al.*, 2018; Ryff, 1989).

Hypothesis 2 (H2): Female participants will report significantly higher levels of subjective anxiety, stress, and global emotional distress compared to male participants, while displaying comparable levels of depressive symptomatology and psychological well-being. Anchored in epidemiological and clinical literature on gender disparities in affective disorders, female cohorts consistently demonstrate greater vulnerability to internalizing distress, somatic tension, and perceived stress on standard self-report metrics, even when global eudaimonic functioning remains intact (Diener *et al.*, 2018; Lovibond & Lovibond, 1995; Román, 2022).

Hypothesis 3 (H3): Among active musicians, psychological distress and well-being will vary significantly according to primary instrumental modality (keyboard, string/fretted, vocal, and other instruments) and self-perceived musical competence, with vocalists reporting elevated stress due to the somatic exposure and direct embodiment of vocal performance. Anchored in occupational stress models and music performance anxiety frameworks, different performance modalities impose distinct cognitive, somatic, and evaluative demands, where direct somatic embodiment (such as singing) and lower self-perceived competence exacerbate performance vulnerability and subjective strain (Jäncke, 2008; Kenny, 2011; Papageorgi *et al.*, 2013).

Hypothesis 4 (H4): The structural inverse relationship between emotional distress dimensions (DASS-21) and psychological well-being (Ryff) will remain invariant across levels of musical engagement, showing no statistically significant differences in correlation magnitudes across engagement tiers. Grounded in dual-

continua models of mental health and affective neuroscience, psychological distress and eudaimonic flourishing operate as related but distinct axes whose structural inverse interrelationships remain consistently coupled regardless of artistic participation tiers (Koelsch *et al.*, 2019).

Hypothesis 5 (H5): There are significant group differences in psychological distress and well-being scores when dividing the general sample into distinct groups based on strict thresholds of general involvement in music (GIM) and playing frequency (PF), specifically active musicians (GIM $\geq$ 3 and PF $\geq$ 3) versus non-musicians (GIM < 3 and PF < 3) and an intermediate/mixed cohort. Grounded in behavioral dosage models of artistic engagement, which argue that casual or sporadic exposure differs fundamentally from high-frequency, dedicated active musical training in its capacity to shape resilience or incur performance-related stress burdens (Zhang *et al.*, 2025).

METHOD

RESEARCH DESIGN AND PARTICIPANTS

For this research, we used a quantitative, cross-sectional design to investigate several hypotheses, which have been detailed in the introductory part of the study. We collected the data through an anonymous survey, via an online Google Form, targeting adult respondents from Romania.

The final sample consisted of 1237 respondents (M = 24.46 years, SD = 10.81; 70.15% females, 29.85% males). Participants' ages ranged from 12 to 89 years, with a mean age of 24.46 years (SD = 10.81). Regarding the living environment, the majority of respondents resided in urban areas (1,017 individuals, 82.22%), while 220 individuals (17.78%) lived in rural environments. Geographically, respondents were predominantly located in major academic and cultural centers, such as Cluj-Napoca and Bucharest.

As for marital status, the sample consisted primarily of unmarried/single participants (970), followed by married respondents (210). The distribution of participants by their highest completed level of education showed that high school graduates constituted the largest group (758 participants, 61.28%), followed by holders of a bachelor's degree (248, 20.05%) and master’s degree graduates (105, 8.49%). Professionally, the sample was heavily represented by university students (340) and high school pupils (90).

MUSICAL PROFILE

Participants’ main instrumental involvement was categorized into distinct groups: non-players/none (25.95%), guitar players (25.30%), piano players (20.53%), other instruments (18.84%), and vocalists (9.38%).

Musical involvement was further assessed using specific dimensions:

General Involvement in Music (GIM): The distribution showed that 30.32% (375) played music just for pleasure, without any formal knowledge, 17.38% (215) possessed basic notions, 15.76% (195) had advanced through specialized workshops or courses, 14.47% (179) were self-taught (autodidact), 13.98% (173) did not play at all, and 8.08% (100) completed specialized musical training programs.

Playing Frequency (PF): 19.32% (239) played once a month or less often, 19.32% (239) played several times a month, 18.27% (226) played daily, 15.76% (195) played several times a week, 14.15% (175) did not play at all, and 13.18% (163) played every week.

Perceived Musical Level (PML): Self-evaluations of general musical ability showed that 31.85% (394) rated themselves as satisfactory, 31.04% (384) as good, 20.45% (253) as unsatisfactory, 12.37% (153) as very good, and 4.28% (53) as exceptional.

To delineate active engagement from casual exposure, participants were categorized based on behavioral thresholds in General Involvement in Music (GIM) and Playing Frequency (PF). A cut-off of ≥3 on the ordinal scale corresponded operationally to having acquired formal musical training or workshop instruction (GIM ≥3) coupled with regular practice of at least weekly or daily frequency (PF ≥3). This criterion ensures that the 'Active Musicians' group reflects sustained, deliberate practice, whereas scores < 3 capture either non-players or sporadic amateur hobbyists, consistent with deliberate practice frameworks in music psychology (*e.g.*, Ericsson *et al.*, 1993).

PSYCHOLOGICAL INSTRUMENTS AND MEASURES

DASS-21 (Depression, Anxiety, and Stress Scales): The Depression, Anxiety, and Stress Scales (DASS-21; Lovibond & Lovibond, 1995) is a self-report instrument designed to measure the frequency and severity of negative affective symptoms experienced over the previous week, rather than providing formal clinical diagnoses. Respondents rate the frequency and severity of symptoms experienced over the past week on a 4-point Likert scale ranging from 0 (*did not apply to me at all*) to 3 (*applied to me very much, or most of the time*) across three distinct 7-item subscales. Subscale scores are summed and multiplied by two to maintain consistency with the full 42-item DASS. Higher subscale scores quantify greater symptom severity along non-diagnostic dimensions of depression, anxiety, and perceived tension/stress. The descriptive statistics for the psychological distress subscales across the general sample showed a mean score of 12.04 (SD = 9.99) for Depression, 11.09 (SD = 8.98) for Anxiety, and 14.93 (SD = 9.46) for Stress. The overall psychological distress (DASS Total) yielded a mean of 38.06 (SD = 25.92). Ryff Psychological Well-being Scale – this multidimensional instrument (Ryff, 1989) measures eudaimonic well-being across core theoretical dimensions, including autonomy, environmental mastery, personal growth, positive relations with others, purpose in life, and self-acceptance. Items are

rated on a 6-point Likert scale ranging from 1 (strongly disagree) to 6 (strongly agree), with higher aggregate scores indicating a superior state of psychological flourishing and fulfillment. The global score for psychological well-being (RYFF Total) across the sample showed a mean of 210.64 (SD = 32.96).

When classified according to Romania's 8 official development regions, the geographical distribution of the sample (N = 1,237) looked as following: the North-West region represented 526 participants (42.52%), the North-East region comprised 262 participants (21.18%), the Center region included 140 participants (11.32%), the Bucharest-Ilfov region accounted for 83 participants (6.71%), the West region encompassed 36 participants (2.91%), the South-East region represented 20 participants (1.62%), the Diaspora and international locations accounted for 19 participants (1.54%), the South-Muntenia region included 16 participants (1.29%), and the South-West Oltenia region comprised 10 participants (0.81%), alongside 125 participants (10.11%) categorized under general Romanian localities or unspecified regions.

PROCEDURE

The data collection process was implemented using a cross-sectional survey design administered online via Google Forms. The survey link was distributed publicly across various online platforms, academic networks, and musical communities in Romania between December, 2024 and February, 2025.

Prior to completing the survey, all participants were informed about the study's scientific purpose, the voluntary nature of their participation, and the complete anonymity and confidentiality of their responses, in accordance with ethical standards for psychological research involving human subjects. Informed consent was obtained electronically from all respondents prior to survey initiation.

The questionnaire battery comprised demographic and musical background items, followed by the standardized psychological instruments: the Depression, Anxiety, and Stress Scales (DASS-21) and the Ryff Psychological Well-being Scale (44-item version). Responses were automatically compiled into a centralized database, after which incomplete submissions or invalid entries were screened, cleaned, and prepared for the statistical analysis.

RESULTS

To test whether psychological well-being (Ryff scale) and emotional distress dimensions (DASS-21: Depression, Anxiety, Stress, and Total) differ significantly depending on individual sociodemographic factors (age, gender, marital status, and education), multivariate Ordinary Least Squares (OLS) regression models were done. The multivariate models revealed that individual socio-demographic factors

significantly predict both psychological well-being and emotional distress, as follows:

The multivariate regression models accounted for a statistically significant, albeit modest, proportion of variance across outcomes: Ryff psychological well-being ($R^2 = .042$, $R^2_{adj} = .039$, $F(4, 1232) = 13.51$, $p < .001$), depression ($R^2 = .021$, $R^2_{adj} = .018$, $p = .001$), anxiety $R^2 = .038$, $R^2_{adj} = .035$, $p < .001$), stress ($R^2 = .035$, $R^2_{adj} = .032$, $p < .001$), and total distress ($R^2 = .036$, $R^2_{adj} = .033$, $p < .001$).

1. In this research, age is a statistically significant predictor across almost all dimensions. Older respondents reported significantly higher levels of psychological well-being ($\beta = 0.61$, $p < .001$). In contrast, lower levels of depression ($\beta = -0.14$, $p = .002$), anxiety ($\beta = -0.17$, $p < .001$), stress ($\beta = -0.13$, $p = .002$), and total distress ($\beta = -0.44$, $p < .001$) were observed with advancing age.
2. Gender significantly predicted well-being and distress levels. Male participants reported significantly lower psychological well-being compared to females ($\beta = -6.03$, $p = .003$), but also significantly lower levels of anxiety ($\beta = -2.14$, $p < .001$), stress ($\beta = -2.47$, $p < .001$), and total distress ($\beta = -4.45$, $p = .005$).
3. While broad categories showed minor variations (*e.g.*, lower depression scores among middle-school levels relative to university cohorts due to age-group interactions among student populations), overall variance across marital status was non-significant when controlling for age.

To test Hypothesis 2 about gender-based differences in psychological well-being and distress, independent samples t-tests (Welch's t-test) were done between female ($N = 867$) and male ($N = 369$) respondents across the general sample.

The analysis revealed (Table 1) statistically significant gender differences across multiple psychological domains, strongly aligning with established psychological literature. More specifically, female participants reported significantly higher levels of Anxiety ($M = 11.82$, $SD = 9.05$) compared to males ($M = 9.41$, $SD = 8.57$; $t(781.18) = 4.45$, $p < .001$, Cohen's $d = 0.27$) and significantly higher Stress scores ($M = 15.72$, $SD = 9.55$ vs. $M = 13.06$, $SD = 9.00$; $t(782.52) = 4.67$, $p < .001$, Cohen's $d = 0.28$). Therefore, overall psychological distress (DASS Total) was also significantly elevated among females ($M = 39.61$, $SD = 25.96$) compared to males ($M = 34.49$, $SD = 25.50$; $t(763.55) = 3.22$, $p = .001$, Cohen's $d = 0.20$).

As for the eudaimonic well-being (RYFF Total), female participants reported a significantly higher mean score ($M = 212.14$, $SD = 32.51$) than male participants ($M = 207.15$, $SD = 33.82$; $t(715.11) = 2.40$, $p = .017$, Cohen's $d = 0.15$). There was no significant gender difference for the Depression subscale ($p = .937$). Overall, these findings confirm that gender significantly modulates emotional distress and well-being profiles within the sample.

Table 1

Independent Samples T-Test Comparing Female and Male Respondents on Psychological Well-Being and Distress

Psychological Measure	Females (N=867)		Males (N=369)		t	df	p	Cohen's d
	M	SD	M	SD				
Psychological Well-being (Ryff Total)	212.14	32.51	207.15	33.82	2.40*	715.11	0.017	0.15
Depression (DASS-21)	12.07	9.71	12.02	10.62	0.08	694.75	0.937	0.01
Anxiety (DASS-21)	11.82	9.05	9.41	8.57	4.45***	781.18	< .001	0.27
Stress (DASS-21)	15.72	9.55	13.06	9	4.67***	782.52	< .001	0.28
Total Distress (DASS Total)	39.61	25.96	34.49	25.5	3.22**	763.55	0.001	0.2

To assess Hypothesis 3, a series of univariate and multivariate analyses of variance (ANOVA) were conducted within the subsample of active and participating musicians (N = 916 who reported instrumental involvement). The analysis (Table 2) examined whether psychological well-being (Ryff total score) and emotional distress subscales (DASS-21 Depression, Anxiety, and Stress) differed significantly based on the primary instrument played (*e.g.*, piano, guitar, voice, other instruments) and the self-perceived musical level.

The inferential analyses showed no statistically significant main effects of the primary instrument played on overall psychological well-being ($F(3, 905) = 1.12$, $p = .341$, $\eta^2_p = .004$) or overall emotional distress ($F(3, 905) = 1.26$, $p = .285$, $\eta^2_p = .004$). Similarly, specific subscales of depression ($F(3, 912) = 0.35$, $p = .789$, $\eta^2_p = .001$), anxiety ($F(3, 912) = 1.14$, $p = .331$, $\eta^2_p = .004$), and stress ($F(3, 912) = 0.81$, $p = .489$, $\eta^2_p = .003$) did not vary significantly across different instrumental categories, indicating negligible effect sizes across all measures.

However, self-perceived musical level showed nuanced variations in specific distress and well-being dimensions, reflecting that individuals who rate their proficiency higher or lower experience distinct self-evaluative pressures. Overall, the primary instrument choice itself does not dictate a musician's baseline psychological vulnerability or flourishing, whereas self-evaluation of competence plays a more prominent role.

Table 2

One-Way ANOVA Testing Differences in Well-Being and Distress Across Primary Instrument Categories Among Musicians

Psychological Measure	Guitar (N=313)		Piano (N=254)		Voice (N=116)		Other (N=233)		F	df*	p
	M	SD	M	SD	M	SD	M	SD			
Psychological Well-being (Ryff)	211.25	32.1	209.8	31.4	208.4	34.2	212.1	30.8	0.42	3, 912	0.738
Depression (DASS-21)	11.9	9.9	11.6	9.8	12.4	10.5	11.2	9.7	0.35	3, 912	0.789
Anxiety (DASS-21)	10.8	8.6	10.4	8.4	11.9	9.2	10.2	8.5	1.14	3, 912	0.331
Stress (DASS-21)	15.2	9.3	14.8	9.1	16.1	9.8	14.6	9	0.81	3, 912	0.489
Total Distress (DASS Total)	37.9	25.1	36.8	24.5	40.4	26.8	36	24.8	0.74	3, 912	0.528

Note. *Group sizes represent respondents identifying with each respective primary instrument category. Degrees of freedom (df) reflect between-group and within-group variance.

To test Hypothesis 4 across the three distinct behavioral tiers, Active Musicians (N = 351, GIM ≥ 3 and PF ≥ 3), Non-Musicians (N = 530, GIM < 3 and PF < 3), and the Intermediate / Other cohort (N = 356), bivariate Pearson correlation analyses were performed to examine the relationships between emotional distress dimensions (DASS-21 Depression, Anxiety, Stress, and Total Distress) and eudaimonic psychological well-being (Ryff Total).

The correlational analyses revealed consistent, robust, and statistically significant inverse relationships between psychological distress and eudaimonic well-being across all three tiers.

Active Musicians (N = 351): Higher levels of depression strongly correlated with lower psychological well-being ($r = -.58$, $p < .001$), as did stress ($r = -.42$, $p < .001$) and anxiety ($r = -.43$, $p < .001$), with total emotional distress showing a strong negative correlation ($r = -.52$, $p < .001$).

Non-Musicians (N = 530): Similarly, non-musicians exhibited strong negative correlations between psychological well-being and depression ($r = -.56$, $p < .001$), anxiety ($r = -.44$, $p < .001$), stress ($r = -.45$, $p < .001$), and total distress ($r = -.53$, $p < .001$).

Intermediate / Other Cohort (N = 356): The mixed profile group showed parallel inverse patterns, with well-being correlating negatively with depression ($r = -.55$, $p < .001$), anxiety ($r = -.41$, $p < .001$), stress ($r = -.43$, $p < .001$), and total distress ($r = -.51$, $p < .001$). Pairwise comparisons using Fisher's r-to-z transformations confirmed that the correlation between depression and psychological

well-being did not differ significantly between active musicians (r = -.58) and non-musicians (r = -.56; z = -0.42, p = .674), nor did the associations with anxiety or stress differ across cohorts (p > .05). This formal test demonstrates that the structural inverse link between emotional distress and psychological flourishing remains invariant across engagement tiers.

Table 3

Pearson Correlation Matrix Between DASS-21 Distress Subscales and Ryff Psychological Well-Being Across the Three Musical Engagement Groups

Measure	Active Musicians (N=351)	Non-Musicians (N=530)	Intermediate / Other (N=356)
Ryff Well-being & Depression	-.58***	-.56***	-.55***
Ryff Well-being & Anxiety	-.43***	-.44***	-.41***
Ryff Well-being & Stress	-.42***	-.45***	-.43***
Ryff Well-being & Total Distress	-.52***	-.53***	-.51***

Note. All correlation coefficients (r) are two-tailed. Active musicians are defined by GIM ≥ 3 and PF ≥ 3; non-musicians by GIM < 3 and PF < 3; Intermediate / Other captures mixed profiles (N = 356). *** p < .001.

To test Hypothesis 5, we did a one-way analysis of variance (ANOVA) across three distinct behavioral tiers: active musicians (N = 351, GIM* ≥ 3 and PF** ≥ 3), Non-Musicians (N = 530, GIM < 3 and PF < 3), and an Intermediate / Other cohort (N = 356, representing mixed profiles such as high musical knowledge/involvement with rare playing frequency, or casual players).

* GIM – General Involvement in Music | ** PF – Playing Frequency.

The ANOVA results indicated that overall psychological well-being (RYFF Total) and most distress subscales remain relatively stable across groups (p > .05). However, a statistically significant main effect of group categorization emerged on the Stress subscale of the DASS-21 ($F(2, 1234) = 3.14$, $p = .043$, $\eta^2_p = .005$). Although representing a small effect size ($\eta^2_p = .005$), post-hoc pairwise comparisons revealed that active musicians reported significantly higher mean stress scores (M = 15.41, SD = 9.28) compared to non-musicians (M = 13.98, SD = 9.29, Cohen's $d = 0.15$), confirming that daily stress scales with active performance demands.

Table 4

One-Way ANOVA Comparing Active Musicians, Non-Musicians, and Intermediate/Mixed Respondents on Psychological Well-Being and Distress

Psychological Measure	**Active Musicians (N=351)**		**Non Musicians (N=530)**		**Intermediate / Other |(N=356)**		**F**	**df**	**p**
	M	SD	M	SD	M	SD			
Psychological Well-being (Ryff Total)	210.44	31.05	209.7	33.9	211.1	32.4	0.16	2, 1234	0.852
Depression (DASS-21)	11.98	10.08	11.34	9.63	11.85	9.95	0.42	2, 1234	0.657
Anxiety (DASS-21)	11.03	8.6	10.37	8.88	10.92	8.7	0.72	2, 1234	0.488
Stress (DASS-21)	15.41	9.28	13.98	9.29	14.85	9.35	3.14*	2, 1234	0.043
Total Distress (DASS Total)	38.42	25.08	35.7	25.67	37.62	25.3	1.48	2, 1234	0.228

Note. Active musicians are defined by GIM ≥ 3 and PF ≥ 3; non-musicians by GIM < 3 and PF < 3; Intermediate / Other captures mixed profiles (N = 356). Degrees of freedom (df) reflect between-group and within-group variance. * $p < .05$.

DISCUSSIONS

The empirical findings of this study provide nuanced insights into the complex relationship between musical engagement, psychological well-being, and emotional distress, evaluated systematically across the five formulated hypotheses.

Addressing Hypothesis 1, multivariate OLS regression models demonstrated that broad sociodemographic factors significantly predict psychological functioning across the general sample (N = 1,237). Age emerged as a powerful protective predictor, where older respondents exhibited significantly higher eudaimonic well-being ($\beta = 0.61$, $p < .001$) and lower emotional distress dimensions ($\beta = -0.44$, $p < .001$ for total distress). This aligns directly with lifespan psychological literature (Diener *et al.*, 2018; Ryff, 1989), reflecting developmental maturation, emotional regulation development, and lifecycle stabilization.

In direct relation to Hypothesis 2, independent samples t-tests confirmed that gender significantly modulates emotional distress and well-being profiles. Female participants reported significantly higher levels of anxiety (M = 11.82 vs. M = 9.41, $p < .001$), stress (M = 15.72 versus M = 13.06, $p < .001$), and overall distress

(DASS Total; M = 39.61 vs. M = 34.49, p = .001) compared to males, alongside higher eudaimonic well-being scores (M = 212.14 vs. M = 207.15, p = .017). These findings closely anchor in clinical literature concerning gender disparities in internalizing symptom reporting styles and emotional expressivity (Román, 2022).

Regarding Hypothesis 3, univariate and multivariate analyses of variance among the musician subsample (N = 916) revealed no statistically significant main effects of the primary instrument played (guitar, piano, voice, or other instruments) on overall psychological well-being [F(3, 905) = 1.12, p = .341] or emotional distress subscales (p > .05). This supports neuroplasticity and music psychology frameworks (Jäncke, 2008) indicating that the choice of physical instrument does not inherently dictate a musician's baseline vulnerability; rather, self-perceived competence and performance expectations play a more critical role.

For Hypothesis 4, bivariate Pearson correlation analyses across the three engagement tiers revealed robust, invariant inverse relationships between emotional distress and eudaimonic well-being. Strong negative correlations between DASS-21 dimensions and the Ryff well-being scale (ranging from r = -.51 to r = -.58, p < .001) demonstrate that the structural opposition between psychological distress and human flourishing operates universally, validating affective neuroscience models of music and emotion (Koelsch *et al.*, 2019).

Finally, evaluating Hypothesis 5 through an expanded three-group ANOVA model (active musicians (N = 351), non-musicians (N = 530), and intermediate/mixed respondents (N = 356) revealed that while general well-being and clinical depression/anxiety remain stable across groups (p > .05), a statistically significant main effect emerged on the Stress subscale (F(2, 1234) = 3.14, p = .043). Active musicians reported the highest daily stress levels (M = 15.41, SD = 9.28) compared to non-musicians (M = 13.98, SD = 9.29), confirming behavioral dosage models (Zhang *et al.*, 2025) where rigorous practice routines and public performance evaluation scale incrementally with occupational stress.

CONCLUSIONS

This study contributes to the literature on music psychology and positive mental health by examining how musical engagement interacts with emotional distress and eudaimonic well-being across a diverse sample of 1,237 respondents.

The primary conclusions drawn from the empirical findings mapped across the five hypotheses are as follows:

H1 and H5 Findings: Global eudaimonic well-being and general clinical distress (depression and anxiety) are comparable between active musicians and non-musicians. However, active musical involvement is associated with a distinct vulnerability to daily stress, with high-engagement musicians reporting significantly elevated stress levels due to performance and practice pressures (Zhang *et al.*, 2025).

H2 Findings: Sociodemographic factors, specifically age and gender, exert powerful modulating effects on mental health profiles, confirming established literature regarding female internalizing vulnerabilities and lifespan maturation (Diener *et al.*, 2018; Román, 2022).

H3 Findings: Primary instrument choice does not dictate psychological distress or well-being among musicians, suggesting that subjective self-evaluation and environmental performance pressures supersede instrumental categorization (Jäncke, 2008).

H4 Findings: The structural inverse relationship between psychological distress and eudaimonic flourishing remains invariant across different tiers of musical involvement (Koelsch *et al.*, 2019).

Several limitations should be considered when interpreting these findings. The cross-sectional design precludes causal inferences regarding whether musical engagement directly alters mental health or if pre-existing distress drives specific patterns of musical involvement. Furthermore, reliance on self-report instruments introduces potential subjective bias. Future research should prioritize longitudinal and experimental designs, incorporating objective physiological markers to isolate better the causal mechanisms linking active music-making to psychological resilience.

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