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Psychometric feasibility and dimensional profiling of the mental health continuum–short form in school-based physical education

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ABSTRACT

Background. Positive mental health is increasingly recognized as an educational resource in physical education; however, previous school-based studies often report mental health as a total score or a problem indicator and rarely show whether emotional, social, and psychological well-being form a useful profile for instructional decision-making. **Objectives.** This study evaluated the psychometric feasibility and dimensional profile of the Mental Health Continuum-Short Form (MHC-SF) in a senior high school physical education context. **Method.** A quantitative descriptive-psychometric design was applied using purposive school-based sampling. Instrument try-out involved 84 students, whereas the main profiling analysis involved 248 students from grades X and XI at Pamekasan 1 State Senior High School. Data were collected through a school-administered survey using the fourteen-item MHC-SF, which measures emotional, social, and psychological well-being. Analysis included item-total correlation, corrected item-total correlation, Cronbach's alpha, Kaiser-Meyer-Olkin index, Bartlett's test, exploratory eigenvalue inspection, descriptive statistics, and non-parametric group comparisons. **Results.** The instrument showed adequate feasibility: all items contributed positively, total-scale reliability was strong, and the item matrix was suitable for dimensional interpretation. Emotional well-being (M = 4.39 per item) and psychological well-being (M = 4.40 per item) were higher than social well-being (M = 3.48 per item). Significant but small differences appeared in social well-being by gender, psychological well-being by grade, and total and social well-being by age. **Conclusion.** The MHC-SF can support school-based positive mental health profiling, especially by identifying social well-being as a practical target for inclusive grouping, cooperative learning, peer support, and counselling coordination in physical education.

Key words: Positive mental health; MHC-SF; adolescents; physical education; psychometrics.

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INTRODUCTION

Adolescent mental health has become a central concern in contemporary education because students' learning is shaped not only by cognitive capacity but also by emotion, social belonging, self-perception, bodily confidence, motivation, and the ability to manage developmental pressures (Callow et al., 2020; Dimyati et al., 2022). The WHO (2022) defines mental health as a state of well-being that enables individuals to recognize their abilities, cope with normal stresses, work productively, and contribute to the community. In schools, this definition positions mental health as an educational resource rather than only a clinical concern, because students' capacity to learn, participate, cooperate, and regulate themselves depends partly on their well-being (Cavioni et al., 2021; Lo et al., 2011; Pavlova et al., 2018).

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Recent literature indicates that mental health, well-being, social-emotional skills, and school adjustment are connected with students' educational participation and achievement (Suppiej et al., 2025). Longitudinal and cross-sectional studies have reported associations between mental health difficulties and poorer academic performance, while more recent work emphasizes the role of resilience, perceived teaching style, school support, coping mechanisms, and social-emotional competencies in adolescent learning and life satisfaction (Addy et al., 2021; Adhikari et al., 2023; Afzali et al., 2024; Agnafors et al., 2021; Ayllon-Salas & Fernandez-Martin, 2024). These findings are especially relevant for senior high school students, who experience academic expectations, peer comparison, identity formation, increasing autonomy, and transition-related pressures (Caso et al., 2021; Cocca et al., 2020; Dimyati et al., 2022).

Physical education provides a distinctive context for studying adolescent well-being (Ebrahim & Hussein, 2025; Yusroni, 2024). Unlike many classroom subjects, physical education requires movement, cooperation, public performance, peer interaction, bodily confidence, discipline, and rapid social feedback (Couceiro et al., 2013; Khairuddin et al., 2023; Tong et al., 2022). Previous research shows that physical activity and fitness are linked with cognitive function, mood, attention, sleep, and academic-related outcomes among adolescents (Alves et al., 2022; Andrade et al., 2024; Andrade et al., 2026; Ates et al., 2024). Therefore, physical education can function both as a setting where mental health is expressed and as a pedagogical space where schools can strengthen students' emotional, social, and psychological functioning (Abdurrahman et al., 2024; Dimyati et al., 2022; Kuznetsova et al., 2022).

However, many educational studies still treat mental health as a general background variable, a total score, or a problem indicator. This approach is limited because positive mental health is not a single undifferentiated state (Cocca et al., 2020; Goethals et al., 2020). A student may feel happy and satisfied with life while still feeling socially disconnected; another student may show personal purpose and self-acceptance while lacking trust or belonging in the school community (Chmelík et al., 2023; Hanifah et al., 2023; Liu et al., 2025; Trabelsi et al., 2022). The Mental Health Continuum-Short Form was developed within the positive mental health tradition and is useful because it captures emotional, social, and psychological well-being in a concise fourteen-item format (Keyes et al., 2008).

International studies have supported the use of the MHC-SF among adolescent populations, including Chinese and Dutch samples (Guo et al., 2015; Kennes et al., 2020). Indonesian scholarship has also begun adapting and applying the instrument in adolescent and school-based research (Jelita et al., 2025; Omega et al., 2023; Puspitasari et al., 2025; Putra, 2023). Nevertheless,

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school-specific evidence remains necessary because an instrument that performs adequately in one population may show different item behavior when applied in another age group, language context, school culture, or physical education learning environment (Kamaruddin et al., 2023; Pavlova et al., 2018; Salam et al., 2023).

The research gap addressed in this article is therefore methodological and practical. Methodologically, previous applications of the MHC-SF in Indonesia have tended to emphasize adaptation, validation, or total mental health scores, while less attention has been given to item-level performance and reliability within an actual school-based physical education sample. Practically, school stakeholders need dimensional information rather than only a total score. Physical education teachers and school counsellors need to know whether emotional, social, or psychological well-being is comparatively stronger or weaker, and whether the pattern differs by gender, grade level, or age (Abdurrahman et al., 2024; Dimyati et al., 2022; Kuznetsova et al., 2022). No separate formal preliminary observational study was conducted before this analysis; instead, the study was initiated from the school-based need for a concise, interpretable instrument that could profile students' positive mental health without treating physical education as an intervention condition.

Accordingly, the purpose of this study was to evaluate the psychometric feasibility and dimensional profile of the MHC-SF among senior high school students in a physical education context. The novelty of the study lies in three contributions: first, it tests the feasibility of the MHC-SF within the physical education learning context; second, it presents a multidimensional profile of emotional, social, and psychological well-being rather than relying on a total score alone; and third, it identifies which well-being dimension most requires school attention. The expected contribution is methodological, by providing feasibility evidence for school-based use of the instrument, and practical, by offering data-driven guidance for teachers and counsellors in designing inclusive and socially supportive physical education practices.

METHOD

Research Design

This study used a quantitative descriptive-psychometric design. The study did not manipulate variables, apply an intervention, or infer causal effects. Instead, it evaluated the feasibility of a positive mental health instrument and then used the instrument to describe students' dimensional well-being profile. This design was appropriate because the purpose of the article was not to test the effect of a physical education program, but to determine whether the MHC-SF functioned adequately in a school-based physical education context and whether the resulting profile could inform educational support.

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The analysis was conducted in two sequential stages. The first stage used a try-out sample to evaluate item validity, internal consistency, and factorability. The second stage used a separate main sample to describe total and dimensional positive mental health patterns. This separation was important because the interpretation of students' well-being profiles should be based on an instrument whose performance had first been examined in the target population.

Participants and Sampling Technique

The study context was Pamekasan 1 State Senior High School, involving students from grades X and XI. Participants were selected using purposive school-based sampling, with eligibility limited to students who were enrolled in the selected grades, available during data collection, and able to complete the survey instructions. The sampling was not intended to represent all Indonesian senior high school students; it was intended to provide a school-level dataset for preliminary instrument feasibility testing and dimensional profiling.

Two datasets were used. The first was a try-out sample of 84 students used to evaluate item validity, internal consistency, and factorability. The second was the main sample of 248 students used to map the dimensional profile of positive mental health. The try-out sample consisted of 34 male and 50 female students; 55 students were in grade X and 29 in grade XI. The main sample consisted of 99 male and 149 female students; 162 students were in grade X and 86 were in grade XI. Student ages ranged from 15 to 18 years. The try-out sample provided six respondents per instrument item, which was considered sufficient for preliminary item screening, reliability analysis, and factorability inspection, but the findings were interpreted as feasibility evidence rather than definitive factorial validation.

Table 1. Characteristics of the try-out and main samples

Characteristic	Try-out sample (n = 84)	Main sample (n = 248)
Gender: Male	34 (40.5%)	99 (39.9%)
Gender: Female	50 (59.5%)	149 (60.1%)
Grade X	55 (65.5%)	162 (65.3%)
Grade XI	29 (34.5%)	86 (34.7%)
Age 15	7 (8.3%)	23 (9.3%)
Age 16	50 (59.5%)	140 (56.5%)
Age 17	23 (27.4%)	75 (30.2%)
Age 18	4 (4.8%)	10 (4.0%)

Instrument

Positive mental health was measured using the Mental Health Continuum-Short Form. The theoretical basis for selecting this instrument was the positive mental health framework developed by Keyes, which conceptualizes mental health not only as the absence of distress but also as the presence of emotional,

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social, and psychological well-being (Keyes et al., 2008). This theoretical position matched the purpose of the present study because physical education involves affective experience, social participation, cooperation, and personal development. The instrument was therefore selected because its three-dimensional structure corresponds with the kind of well-being information that schools need for educational decision-making.

The MHC-SF consists of 14 items organized into three dimensions: emotional well-being, social well-being, and psychological well-being. Items 1 to 3 represent emotional well-being, items 4 to 8 represent social well-being, and items 9 to 14 represent psychological well-being. Responses were recorded using a six-point Likert-type scale, with higher scores indicating a higher frequency or stronger presence of positive mental health experiences.

Emotional well-being captures happiness, interest in life, and life satisfaction. Social well-being captures contribution to society, belonging, social actualization, belief in people, and social coherence. Psychological well-being captures self-acceptance, management of daily responsibilities, warm relationships, personal growth, confidence in expressing ideas, and a sense of direction and meaning. Table 2 presents the item representation used in this study so that the psychometric results can be interpreted not only by item code but also by the well-being content represented by each item.

Although the MHC-SF has been evaluated in adolescent populations in other countries and adapted in Indonesian scholarship, feasibility still needed to be re-examined in the present school context. Instrument performance may vary across age groups, language contexts, school culture, and physical education learning environments. For that reason, the try-out stage was conducted before the main profiling analysis.

Table 2. MHC-SF dimensions and item content represented in the school-based analysis

Item code	Dimension	Content represented in the MHC-SF item
MHCSF_1	Emotional well-being	Happiness
MHCSF_2	Emotional well-being	Interest in life
MHCSF_3	Emotional well-being	Life satisfaction
MHCSF_4	Social well-being	Contribution to society
MHCSF_5	Social well-being	Belonging to a community
MHCSF_6	Social well-being	Belief that society is becoming better
MHCSF_7	Social well-being	Belief that people are basically good
MHCSF_8	Social well-being	Understanding how society works
MHCSF_9	Psychological well-being	Liking most parts of one's personality
MHCSF_10	Psychological well-being	Managing responsibilities of daily life

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MHCSF_11	Psychological well-being	Warm and trusting relationships
MHCSF_12	Psychological well-being	Experiences that support growth
MHCSF_13	Psychological well-being	Confidence in thinking and expressing ideas
MHCSF_14	Psychological well-being	Direction or meaning in life

Procedures and Ethical Considerations

Data were collected through a school-based survey procedure. The try-out sample was used before the main analysis to assess whether the MHC-SF items functioned adequately in the target population. After the instrument showed acceptable performance, the main sample data were analyzed to describe total and dimensional positive mental health profiles. The procedure was designed to keep psychometric screening separate from the main profiling analysis.

Participation was administered in the school context with attention to clarity of instruction and respondent understanding. School permission was obtained before data collection. Students received an explanation of the study purpose, the voluntary nature of participation, and the confidentiality of their responses. No identifying information was reported in the analysis or manuscript. Physical education served as the educational context in which students' well-being was interpreted, not as an intervention or treatment condition.

Analysis Plan

Data analysis consisted of descriptive statistics, item-total correlation, corrected item-total correlation, Cronbach's alpha, Kaiser-Meyer-Olkin index, Bartlett's test of sphericity, exploratory eigenvalue inspection, and non-parametric group comparisons. The item-total analyses were used to evaluate how strongly each item contributed to the total scale. Cronbach's alpha was used to assess internal consistency for the total scale and each dimension. Because the emotional dimension contained only three items, its reliability was interpreted cautiously rather than treated as conclusive evidence of subscale precision.

Kaiser-Meyer-Olkin and Bartlett's tests were used as factorability indicators to examine whether the item correlation matrix was adequate for dimensional interpretation. These statistics were followed by exploratory eigenvalue inspection, but the analysis did not claim a full confirmatory factor analysis. This distinction is important because the present study provides preliminary feasibility and profiling evidence, while future studies should test the three-dimensional structure using confirmatory factor analysis and measurement invariance procedures.

Because Shapiro-Wilk tests indicated non-normality for the total and dimensional scores, Mann-Whitney U tests were used for gender and grade comparisons, while Kruskal-Wallis tests were used for age-group comparisons.

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Means and standard deviations are reported for interpretability, while statistical conclusions are based on the non-parametric tests. Rank-biserial coefficients were interpreted as indicators of effect magnitude for the Mann-Whitney comparisons.

Scope and limitations of methodology

The analysis focused on psychometric performance and positive mental health profiling. Physical education served as the educational context, but physical education grades were not treated as the dependent variable in this manuscript. This decision preserved the independence of the present article as a measurement and profile study. The cross-sectional, single-school design limits generalization and does not allow causal interpretation.

FINDINGS AND DISCUSSIONS

Findings

The item-level analysis showed that all MHC-SF items contributed positively to the total construct. In the try-out sample, uncorrected item-total correlations ranged from 0.387 to 0.712. Corrected item-total correlations ranged from 0.268 to 0.645. The lowest corrected coefficient was observed for the item concerning whether people are basically good. Although this item was weaker than the other items, it remained positive and theoretically important because it represents the social well-being dimension.

Table 3 reports the item-level psychometric performance after the item contents have been identified in Table 2. The results show that the social items were generally more variable than the emotional items, which is consistent with the substantive finding that social well-being was the most differentiated dimension in the main sample.

Table 3. Item-level psychometric performance of the MHC-SF in the try-out sample

Item	Mean	SD	Item-total r	Corrected r	α if deleted
MHCSF_1	4.56	1.33	0.594	0.524	0.869
MHCSF_2	4.36	1.45	0.593	0.515	0.869
MHCSF_3	4.00	1.58	0.665	0.590	0.865
MHCSF_4	3.17	1.43	0.695	0.633	0.863
MHCSF_5	3.46	1.65	0.635	0.552	0.867
MHCSF_6	3.57	1.58	0.574	0.486	0.871
MHCSF_7	3.80	1.73	0.387	0.268	0.883
MHCSF_8	3.67	1.52	0.631	0.555	0.867
MHCSF_9	4.15	1.55	0.643	0.566	0.866
MHCSF_10	4.44	1.40	0.596	0.522	0.869
MHCSF_11	4.14	1.56	0.615	0.534	0.868
MHCSF_12	4.58	1.45	0.667	0.600	0.865
MHCSF_13	3.87	1.63	0.699	0.627	0.863

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MHCSF_14	4.24	1.56	0.712	0.645	0.862

Internal consistency evidence was adequate for the study purpose. Cronbach's alpha for the total scale was 0.876 in the try-out sample and 0.867 in the main sample. Subscale reliability in the try-out sample was 0.665 for emotional well-being, 0.742 for social well-being, and 0.829 for psychological well-being. The emotional dimension had a lower alpha than the commonly used 0.70 reference value; therefore, emotional well-being should be interpreted as a brief three-item indicator rather than as a highly precise stand-alone subscale. The psychological dimension showed the strongest internal consistency.

Table 4. Factorability and exploratory eigenvalue evidence

Sample	n	KMO	Bartlett's test	First three eigenvalues	Variance explained
Try-out sample	84	0.844	χ^2 (91) = 445.78, $p < 0.001$	5.54; 1.65; 1.03	58.6%
Main sample	248	0.885	χ^2 (91) = 1078.92, $p < 0.001$	5.23; 1.21; 1.14	54.2%

The Kaiser-Meyer-Olkin values were above 0.80 in both samples, and Bartlett's tests were significant. These results indicated that the item correlations were sufficient for exploratory dimensional interpretation. The eigenvalue pattern suggested a strong general positive mental health factor while retaining meaningful dimensional information.

The dimensional profile of the main sample showed that emotional well-being and psychological well-being had higher per-item means than social well-being. The total MHC-SF mean was 56.95 with a standard deviation of 12.45. On a per-item basis, emotional well-being averaged 4.39, social well-being 3.48, and psychological well-being 4.40. This means that students' positive mental health was not uniformly distributed across the three dimensions: the personal and affective dimensions appeared stronger than the social dimension.

Table 5. Dimensional profile of MHC-SF scores in the main sample

Dimension	Observed range	Mean	SD	Per-item mean	Per-item SD
Emotional well-being	3-18	13.18	3.32	4.39	1.11
Social well-being	5-30	17.38	5.23	3.48	1.05
Psychological well-being	6-36	26.39	6.11	4.40	1.02
Total positive	14-84	56.95	12.45	4.07	0.89

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mental health

Figure 1 visualizes the core dimensional pattern. The clearest pattern is the gap between social well-being and the other two dimensions. While emotional and psychological well-being clustered near the upper-middle range of the response scale, social well-being was visibly lower, indicating that students' perceived belonging, contribution, trust, and social coherence were the most vulnerable aspects of the profile.

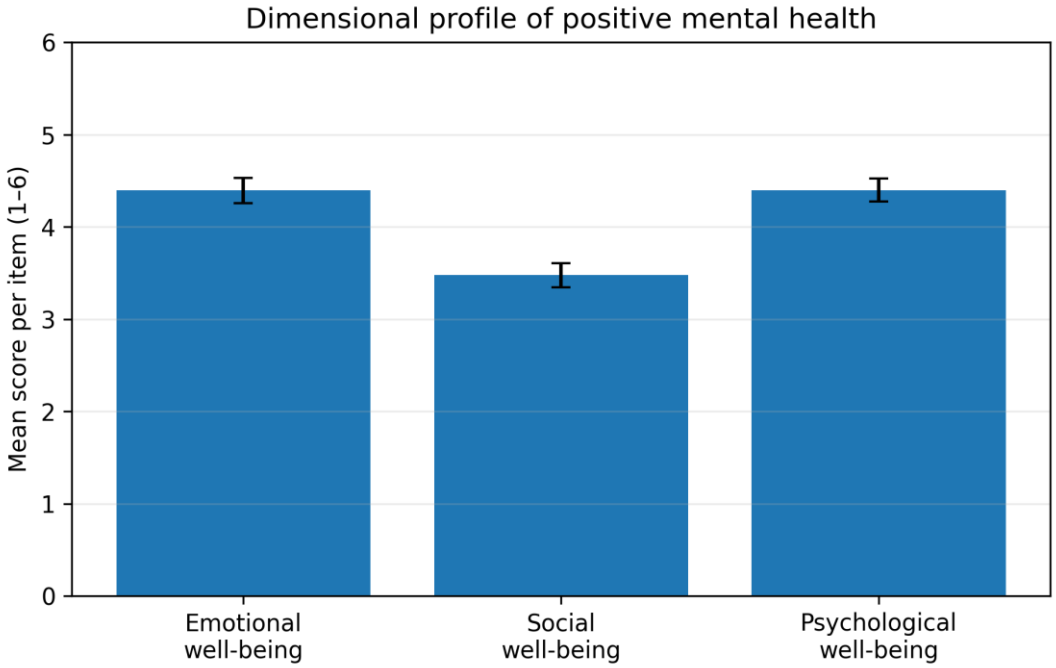

Figure 1. Dimensional profile of positive mental health

Figure 2 shows that the lower social well-being pattern was consistent across gender and grade groups. Male students and grade XI students had slightly higher values in some dimensions, but the visual profile also shows that the differences were not large. The main instructional message is therefore not group separation, but the need to improve social participation across the class.

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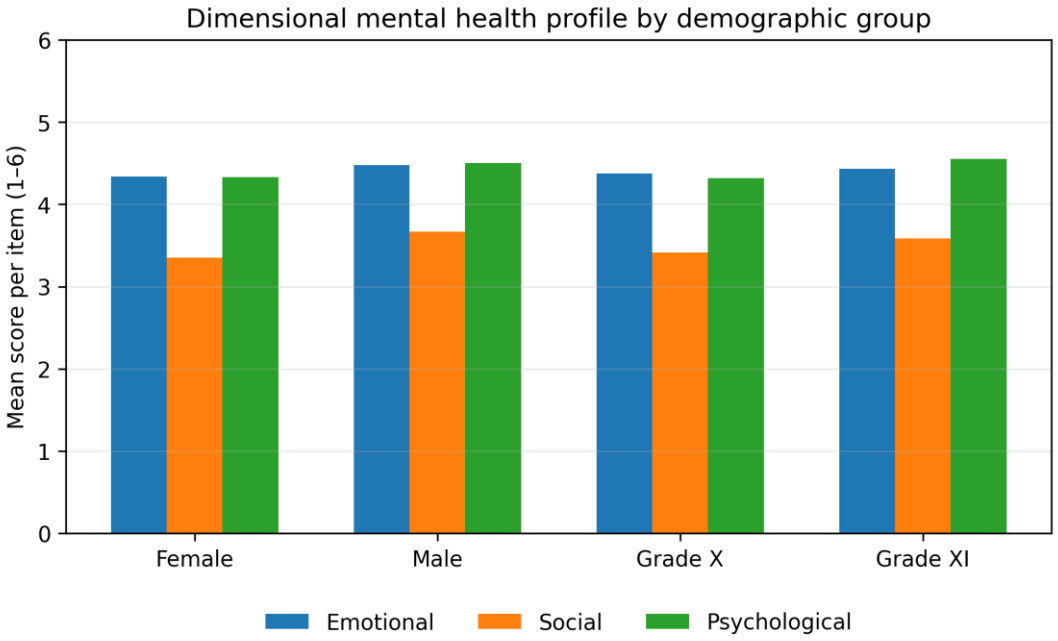

Figure 2. Dimensional mental health profile by gender and grade

Figure 3 presents the item-level mean profile. The lowest item mean appeared in the social contribution item, while the highest appeared in the psychological growth item. This item-level pattern strengthens the dimensional interpretation because the weaker social profile was not produced by a single isolated item only; several social indicators were positioned below the strongest emotional and psychological indicators

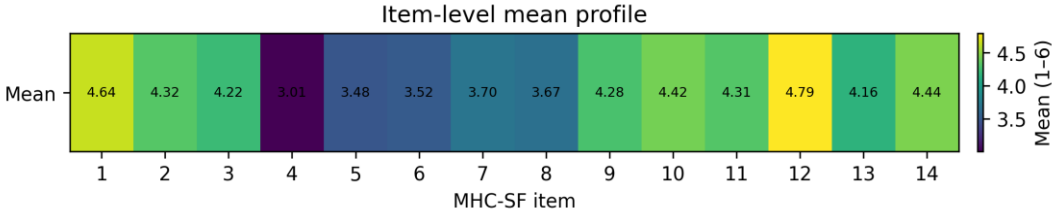

Figure 3. Item-level mean profile of the MHC-SF in the main sample

Group comparisons showed that gender differences were most visible in social well-being. Male students had higher social well-being than female students, while the total score and other dimensions were not significantly different. Grade-level analysis showed that grade XI students had significantly higher psychological well-being than grade X students. Age-group analysis showed significant differences in total positive mental health and social well-being, with seventeen-year-old students showing the strongest profile. However, the Mann-Whitney effect indices were small; therefore, the results should be interpreted as profile signals rather than large practical separations between groups.

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Table 6. Non-parametric comparisons of MHC-SF scores by demographic group

Comparison	Group means	Statistic	p	Effect/index
Gender - Total	Female 55.74; Male 58.76	U=6537.5	0.130	rank-biserial=-0.114
Gender - Emotional	Female 13.02; Male 13.42	U=6989.5	0.484	rank-biserial=-0.052
Gender - Social	Female 16.74; Male 18.32	U=6148.0	0.026	rank-biserial=-0.166
Gender - Psychological	Female 25.98; Male 27.01	U=6813.5	0.309	rank-biserial=-0.076
Grade - Total	X 56.11; XI 58.52	U=6272.5	0.197	rank-biserial=-0.100
Grade - Emotional	X 13.12; XI 13.30	U=6689.0	0.605	rank-biserial=-0.040
Grade - Social	X 17.09; XI 17.92	U=6503.0	0.389	rank-biserial=-0.066
Grade - Psychological	X 25.91; XI 27.30	U=5900.0	0.047	rank-biserial=-0.153
Age - Total	15y 50.78; 16y 57.41; 17y 58.61; 18y 52.20	H=8.20	0.042	Kruskal-Wallis
Age - Emotional	15y 11.65; 16y 13.40; 17y 13.33; 18y 12.50	H=6.21	0.102	Kruskal-Wallis
Age - Social	15y 15.30; 16y 17.49; 17y 18.17; 18y 14.60	H=8.68	0.034	Kruskal-Wallis
Age - Psychological	15y 23.83; 16y 26.52; 17y 27.11; 18y 25.10	H=5.91	0.116	Kruskal-Wallis

Discussion

The first main finding is that the MHC-SF showed adequate psychometric feasibility in the school-based physical education context. All items contributed positively to the total construct, the total-scale alpha was strong in both samples, and the KMO and Bartlett results indicated that the correlation matrix was suitable for exploratory dimensional interpretation. This means that the scale did not operate as a set of unrelated indicators; it captured a coherent construct of positive mental health while still allowing interpretation across emotional, social, and psychological dimensions.

This finding reinforces the theoretical position that positive mental health is multidimensional rather than merely the absence of psychological problems. The MHC-SF was developed to operationalize emotional, social, and psychological well-being, and the present results support the relevance of that framework in a school setting (Keyes et al., 2008). The finding is also consistent with international adolescent evidence showing that the MHC-SF can perform adequately in different cultural contexts (Guo et al., 2015; Kennes et al., 2020).

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However, the present study adds that local psychometric checking remains necessary before the instrument is used for school-level decision-making.

The low social well-being score deserves special attention because the physical education classroom can intensify social comparison. Movement performance is often visible to peers, team formation may expose inclusion or exclusion, and feedback can be experienced publicly. In such a context, students' sense of being accepted, trusted, and socially valued may become more fragile than their general life satisfaction or personal purpose (Al-Jubouri & Hussein, 2022; Naylor & Yeager, 2013). This interpretation is aligned with adolescent literature emphasizing that peer relationships, school support, social anxiety, and social-emotional competencies shape students' learning and adjustment (Abinaya & Vadivu, 2024; Addy et al., 2021; AlQaisi et al., 2025; Anguzu et al., 2025; Ayllon-Salas & Fernandez-Martin, 2024).

The present data therefore extend previous work by showing that adolescent well-being cannot be adequately understood from a total score alone. If only the total MHC-SF score were reported, the most actionable finding would be hidden. The dimensional profile shows that physical education teachers should not merely aim to improve overall well-being; they should specifically strengthen the social ecology of the class through cooperative learning, peer mentoring, inclusive grouping, shared roles, and feedback practices that protect students from embarrassment. This finding should be interpreted proportionately because the rank-biserial effect was small. Statistical significance indicates a detectable difference in this sample, but not a large separation between male and female students. Nevertheless, the result aligns with studies emphasizing the relevance of gender-sensitive approaches in adolescent mood, body image, self-esteem, and social-emotional development (Andrade et al., 2024; Artigues-Barberà et al., 2025; Ayllon-Salas & Fernandez-Martin, 2024). For physical education teachers, the implication is to design grouping systems, feedback practices, and performance tasks that reduce humiliation, prevent exclusion, and strengthen belonging for all students, particularly those who may feel less socially secure.

From a pedagogical perspective, the results indicate that physical education teachers can use dimensional mental health information to design more inclusive learning. If social well-being is weak, teachers can increase cooperative tasks, peer mentoring, inclusive grouping, rotating team roles, and non-humiliating performance evaluation. If psychological well-being is weak, teachers can emphasize mastery goals, personal progress, student voice, and confidence-building feedback. If emotional well-being is weak, teachers can use supportive communication, positive feedback, and reflective routines (Fierro-suero & Jos, 2022; Rivera-Pérez et al., 2020; Westerlund, 2023). School counsellors can use the profile to coordinate group guidance or targeted support for students who

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show low belonging or social confidence (Cocca et al., 2020; Goethals et al., 2020; Kuznetsova et al., 2022).

At the same time, the evidence should be interpreted as feasibility evidence rather than definitive validation. The emotional well-being alpha was slightly below the common 0.70 reference point, and the analysis did not include confirmatory factor analysis. This does not invalidate the emotional dimension because brief subscales often produce lower alpha values, but it does mean that emotional well-being should be used as a profile indicator in combination with the total and other dimensions. Future studies should therefore test whether the three-dimensional structure is stable across larger and more diverse school samples.

The second main finding is that social well-being was lower than emotional and psychological well-being. Students reported relatively stronger happiness, life satisfaction, self-acceptance, growth, and sense of direction, but weaker perceived contribution, belonging, trust, and social coherence. This pattern is educationally important because physical education is a social learning environment. Participation is visible, embodied, and often group-based; therefore, students who feel emotionally positive or personally capable may still experience limited well-being when peer belonging and social confidence are weak.

The third main finding is that gender differences appeared primarily in social well-being. Male students showed higher social well-being than female students, whereas emotional well-being, psychological well-being, and total scores were not significantly different. This pattern suggests that gendered experiences in physical education may be more visible in social participation than in overall well-being. Activities involving public performance, group formation, body confidence, and peer evaluation may create different social experiences for male and female students.

The fourth main finding is that grade XI students had higher psychological well-being than grade X students. Psychological well-being includes self-acceptance, responsibility, warm relationships, personal growth, confidence in expressing ideas, and a sense of meaning. The higher score among grade XI students may reflect greater adaptation to school routines, stronger familiarity with peers and teachers, or greater confidence in managing daily responsibilities. Because the effect size was small, the finding should be read as a developmental signal rather than a strong grade-based divide.

The fifth main finding is that age differences appeared in total positive mental health and social well-being. Seventeen-year-old students showed the strongest profile, whereas the youngest and oldest groups were comparatively lower. The lower score among younger students may indicate a need for orientation and belonging support during adjustment to senior high school. The

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lower score among older students may reflect transition-related pressure, although this explanation should be tested in future studies. Contemporary school mental health literature similarly emphasizes that adolescent support should be sensitive to developmental stage, school pressure, family context, and social environment (Adhikari et al., 2023; Ahmead, 2025; Anselimus, 2025).

Taken together, the findings contribute to physical education research in two ways. Methodologically, the study demonstrates the value of testing instrument feasibility before using well-being scores for school interpretation. Substantively, it shows that the most actionable information emerges from the dimensional profile, especially the comparatively lower social well-being score. The finding that MHCSF_7 had the lowest corrected item-total correlation should not lead automatically to item deletion because the item represents belief in people, a theoretically meaningful aspect of social well-being. Reliability improvement alone should not override theoretical coverage.

Limitations

Several limitations must be acknowledged. The study was conducted in one school, which limits generalization. The cross-sectional design prevents conclusions about changes over time. The analysis used item correlations, alpha, KMO, Bartlett's test, and exploratory eigenvalue evidence; future research should apply confirmatory factor analysis and measurement invariance testing across gender, grade, and age. Future studies should also examine whether physical activity, fitness, motivation, self-efficacy, body confidence, teacher support, and peer climate mediate the relationship between positive mental health and participation in physical education.

CONCLUSION

This study evaluated the psychometric feasibility of the MHC-SF and described the dimensional profile of students' positive mental health in a senior high school physical education context. The instrument showed adequate feasibility for school-based profiling: all items contributed positively, total-scale reliability was strong, and the item matrix supported exploratory dimensional interpretation. The main substantive message is that students' positive mental health should not be read only as a total score. Emotional and psychological well-being were relatively stronger, whereas social well-being was the dimension most in need of pedagogical and counselling attention. The study contributes to physical education practice by showing how a brief multidimensional instrument can guide school action. Teachers can use the profile to strengthen inclusive grouping, cooperative learning, peer support, and non-humiliating performance assessment, while school support services can use the same information to identify students who may need stronger belonging and social confidence.

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Because the sample was limited to one school and the design was cross-sectional, the findings should not be generalized to all Indonesian students. The scientific value of the study lies in demonstrating that multidimensional positive mental health profiling can make physical education more responsive to students' emotional, social, and psychological needs.

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AUTHOR CONTRIBUTION STATEMENT

AN contributed to conceptualization, data collection, data analysis, interpretation, and manuscript drafting. AN contributed to conceptual supervision, methodological guidance, and manuscript review. DLJ contributed to data interpretation, literature integration, and final manuscript editing. All authors approved the final version of the manuscript.

AI DISCLOSURE STATEMENT

The author used ChatGPT by OpenAI during manuscript preparation for language refinement, structural organization, and formatting support. After using the tool, the author thoroughly reviewed and edited the content as needed and takes full responsibility for the content of the publication. The data analysis, interpretation, and final scholarly responsibility remain with the authors.

CONFLICTS OF INTEREST

The authors declare that there are no financial, institutional, or personal conflicts of interest that could influence the conduct of this study, the analysis of data, the preparation of the manuscript, or its publication.

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