

HEALTH-RELATED QUALITY OF LIFE AND ASSOCIATED FACTORS AMONG MALE AND FEMALE ADOLESCENTS IN INDONESIAN ORPHANAGES: A COMPARATIVE STUDY

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ABSTRACT

Adolescents living in orphanages face a high risk of health problems, making the assessment of their health-related quality of life (HRQoL) critical. Characterizing gender-based variations in HRQoL is essential to understanding the distinct healthcare needs of this vulnerable population. This study aimed to evaluate gender-specific differences in HRQoL and identify associated factors among adolescents living in orphanages. A total of 238 adolescents (112 males, 126 females) aged 13-18 years were recruited through convenience sampling from 16 orphanages in Malang City, East Java, Indonesia. HRQoL was measured using the KIDSCREEN-27 Child and Adolescent Version, which assesses five dimensions: physical well-being, psychological well-being, autonomy and parent relations, peers and social support, and school environment. Group comparisons were conducted using independent samples t-tests and one-way ANOVA, and multiple-regression analysis was employed to examine factors of HRQoL. Results showed significant gender differences in total HRQoL scores, with females having lower scores than males ($p < 0.05$). Female adolescents also had lower scores in the physical well-being ($p < 0.05$) and psychological well-being ($p < 0.05$) dimensions. Conversely, no significant gender differences were found in autonomy and parent relations, peers and social support, or school environment dimensions. Only age was significantly associated with HRQoL among male adolescents. These findings suggest that female adolescents in orphanages have lower HRQoL scores than their male counterparts, particularly in physical and psychological health. This highlights the importance of incorporating gender-specific considerations in future interventions to improve HRQoL among adolescents living in orphanages.

Keywords: Adolescent; gender; health-related quality of life; indonesia; orphanages



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BACKGROUND

Adolescence is a pivotal developmental stage characterized by significant transformations that shape health trajectories throughout life (Kreniske et al., 2020). During this period, the foundation for lifelong health and well-being is often established, making the assessment of health-related quality of life (HRQoL) particularly pertinent (Wang et al., 2022).

HRQoL encompasses various dimensions of well-being, including physical health, psychological state, social relationships, and environmental factors (Mikkelsen et al., 2020). A high HRQoL during adolescence is linked to positive developmental outcomes, whereas compromised HRQoL can lead to adverse health consequences (Wang et al., 2022).

Adolescents living in orphanages confront distinct challenges that significantly affect their HRQoL, and emerging evidence highlighting notable gender disparities (Jabeen & Ijaz, 2024). Studies have shown that orphaned girls often experience higher levels of psychological distress than boys, particularly those who are paternally orphaned (Cotton et al., 2020; Li et al., 2024). Furthermore, adolescents in orphanages—who frequently have a history of maltreatment—report lower HRQoL across multiple domains, including emotional and physical well-being (Greger et al., 2016).

Gender differences in HRQoL reflect distinct biological, psychosocial, and cultural pathways that shape adolescents' well-being. Typically, girls report poorer psychosocial outcomes, while boys exhibit higher levels of physical activity but also greater externalizing behaviors (Griffiths et al., 2017). In institutional settings, these divergent patterns are intensified by gender-based caregiving practices and stressors, making it essential to analyze gender-specific variations to tailor intervention to the unique needs of each group (Mohammadzadeh et al., 2018).

In Indonesia, orphanages function as primary institutions for children and adolescents who have lost parental care due to various socioeconomic and health-related factors (Mustaqim, 2024). Although there is a growing body of literature on HRQoL among institutionalized adolescents worldwide, data from Indonesia remain scarce, and few studies have examined gender-specific differences in their HRQoL (Campbell et al., 2021).

This study aims to assess the HRQoL and its associated factors among male and female adolescents living in Indonesian orphanages. Employing a comparative design, the study seeks to identify gender-specific patterns in HRQoL and the factors contributing to these differences. The findings will provide valuable insights for policymakers, orphanage caregivers, and health professionals especially nurses to develop gender-specific interventions that enhance the well-being of this vulnerable population.

METHOD

Study design

A multicenter cross-sectional study was conducted in December 2024, focusing on orphanages located in Malang City, Indonesia.

Participants

Orphanages were selected using convenience sampling, with 16 institutions agreeing to participate in the study. Inclusion criteria required adolescents (aged 13-18 years) to have lived at the orphanage for at least six months, had no diagnosed physical or mental disabilities, and be willing to participate. Individuals who were unavailable during the research team's visits to the orphanages were excluded from the study. The minimum sample size was determined using Cochran's formula for sample size calculation. Assuming a 95% confidence level ($Z = 1.96$), a 5% margin of error ($e = 0.05$), and an estimated baseline proportion of 15% ($p = 0.15$, $1 - p = 0.85$) based on prior literature, the required minimum sample size was calculated to be 196 respondents.

$$n = (Z^2 p(1-p)) / e^2$$

$$n = ((1.96)^2 \times 0.15 \times 0.85) / (0.05)^2$$

$$n = (3.8416 \times 0.1275) / 0.0025 = 195.92 \approx 196$$

The analysis in this study included 238 adolescents.

Instruments

Socio-Demographic Participants

Data were collected using a questionnaire developed for this study, which gathered information on gender, age, length of residence in the orphanage, education level, orphan status, religion, and the accreditation level of the institution.

HRQoL (Health-Related Quality of Life)

The KIDSCREEN-27 instrument (Ravens-Sieberer et al., 2007) was employed to assess HRQoL. This instrument evaluates five dimensions: physical well-being (5 items), psychological well-being (7 items), autonomy and parent relations (7 items), peers and social support (4 items), and school environment (4 items). Items were rated on a 5-point Likert scale, ranging from 1 (not at all) to 5 (very much), with select items (1, 9, 10, and 11) reverse-scored. Total scores range from 27 to 135, with higher scores indicating better HRQoL (Ravens-Sieberer et al., 2007). Permission to use the original instrument was obtained from the authors prior to its application in this study. The instrument was translated into Indonesian and culturally adapted through a forward-backward translation process consisting of five phases: forward translation, backward translation, review of both translations, cognitive debriefing, and internal harmonization (Lee et al., 2019). The internal consistency of the instrument, as measured by Cronbach's alpha, was found to be 0.86, indicating good reliability.

Data collection

Prior to fieldwork, all research assistants underwent standardized training to ensure uniform administration. The research team coordinated visits with the directors of each institution, conducted onsite data collection, and recorded responses using Kobo Toolbox (www.kobotoolbox.org) on tablets or laptops. To minimize confusion and nonresponses, items were read aloud to participants. The average completion time was ten minutes per participant.

Data analysis

Data analysis was performed using IBM SPSS Statistics version 26.0. Cronbach's α was used to assess the internal consistency of the KIDSCREEN-27 (Taber, 2018). Group comparisons were conducted using independent samples t-tests and one-way ANOVA, while multiple regression analysis was employed to examine factors influencing HRQoL. Prior to parametric testing, the assumptions of normality and homogeneity of variance assumption were verified using the Shapiro-Wilk and Levene's tests, respectively.

Multiple linear regression analysis was conducted using the total HRQoL score as the dependent variable. Categorical predictors were dummy-coded with the following reference categories: Age (13–15 years), Education (junior high school), Religion (Islam), Orphan status (not orphan), duration of living in orphanages (1-3 years), and Accreditation of orphanages (Level A).

Ethical considerations

Ethical clearance for this study was granted by the Institutional Review Board of the Institute of Technology, Science, and Health RS dr. Soepraoen, Malang (KEPK-EC-11/XII/2023). The board approved a dual consent protocol, whereby formal written permission was secured from the director of each institution, acting as the legal guardian, followed by written assent obtained from the adolescent participants prior to data collection.

To ensure voluntariness, caregivers and directors were not present during data collection. Confidentiality was safeguarded by collecting data anonymously using codes instead of personal names, and the data were kept exclusively by the primary researcher.

RESULT

This study sample comprised 238 adolescents from 16 orphanages in Malang City: 112 males (47.1%) and 126 females (52.9%). Age was categorized into two groups: 13–15 years and 16–18 years. A higher proportion of males were in the younger age group (62.5%), whereas females were more prevalent in the older age group (54.8%) (Table 1).

Table 1. Characteristic Participants (males=112 (47.1%), females 126 (52.9%))

Variables	Categories	Males (%)	Females (%)	Total (%)	Mean±SD
Age	13-15 Years	70 (62.5%)	57 (45.2%)	127 (53.4%)	15.3±1.6
	16-18 Years	42 (37.5%)	69 (54.8%)	111 (46.6%)	
Education	Junior High School	72 (64.3%)	46 (36.5%)	118 (49.6%)	
	Senior High School	40 (35.7%)	80 (63.5%)	120 (50.4%)	
Religion	Islam	109 (97.3%)	103 (81.7%)	212 (89.0%)	
	Protestant	3 (2.7%)	15 (11.9%)	18 (7.6%)	
	Catholicism	0	8 (6.4%)	8 (3.4%)	
Orphan Status	Not Orphan	57 (50.9%)	65 (51.6%)	122 (51.3%)	
	Maternal Orphan	9 (8.0%)	11 (8.7%)	20 (8.4%)	
	Paternal Orphan	40 (35.7%)	34 (27.0%)	74 (31.1%)	
	Double Orphan	6 (5.4%)	16 (12.7%)	22 (9.2%)	
Living in Orphanages	1-3 Years	78 (69.7%)	70 (55.6%)	148 (62.2%)	3.3±2.4
	4-5 Years	24 (21.4%)	24 (19.0%)	48 (20.2%)	
	More than 5 Years	10 (8.9%)	32 (25.4%)	42 (17.6%)	
Accreditation of Orphanages	A	4 (3.6%)	13 (10.4%)	17 (7.1%)	
	B	39 (34.8%)	63 (50.0%)	102 (42.9%)	
	C	26 (23.2%)	25 (19.8%)	51 (21.4%)	
	Unaccredited	43 (38.4%)	25 (19.8%)	68 (28.6%)	

Table 2. Comparison of HRQoL between Male and Female Adolescents in Orphanages

Variables	Male	Female	p
Total HRQoL	96.2±12.2	92.7±13.0	0.03*
Physical well-being	16.6±3.3	15.6±3.8	0.04*
Psychological well-being	24.4±4.3	22.5±4.4	0.00*
Autonomy and parent relations	25.2±3.8	24.3±4.4	0.09
Peers and social support	15.1±2.9	15.2±2.9	0.67
School environment	14.9±2.7	15.2±2.6	0.49

* $p < 0.05$

Table 2 shows that the total HRQoL score was higher for male adolescents (96.2 ± 12.2) than for female adolescents (92.7 ± 13.0), and this difference was statistically significant ($p < 0.05$). Gender differences were also significant in the physical well-being dimension (male = 16.6 ± 3.3 vs. female = 15.6 ± 3.8 , $p < 0.05$) and the psychological well-being dimension (male = 24.4 ± 4.3 vs. female = 22.5 ± 4.4 , $p < 0.05$). The autonomy and parent relations score was slightly

higher for males (25.2 ± 3.8) than for females (24.3 ± 4.4), but this difference was not statistically significant ($p > 0.05$). No significant gender differences were observed for peers and social support (male = 15.1 ± 2.9 vs. female = 15.2 ± 2.9 , $p > 0.05$) or for school environment (male = 14.9 ± 2.7 vs. female = 15.2 ± 2.6 , $p > 0.05$).

Table 3. Multiple Regression Analysis of Associated Factors of HRQoL Male and Female Adolescents in Orphanages

Variable	Adjusted for socioeconomic factors				95% CI for coefficient	
	β	SE	t-value	p-value	Lower	Upper
Male						
Age						
13-15 Years (ref)						
16-18 Years	-7.5	4.0	-1.9	0.04*	-15.4	-0.49
Education						
Junior High School (ref)						
Senior High School	7.4	4.1	1.8	0.08	-0.8	14.5
Religion						
Islam (ref)						
Protestant	-6.9	7.5	-0.9	0.36	-21.8	8.1
Orphan Status						
Not Orphan (ref)						
Maternal Orphan	1.2	4.6	0.3	0.79	-7.9	10.4
Paternal Orphan	-4.5	2.7	-1.7	0.10	-9.9	0.8

Variable	Adjusted for socioeconomic factors				95% CI for coefficient	
	β	SE	t-value	p-value	Lower	Upper
Double Orphan	-8.2	5.6	-1.5	0.15	-19.3	2.9
Living in Orphanages						
1-3 Years (ref)						
4-5 Years	-0.4	3.1	-0.1	0.90	-6.7	5.8
More than 5 Years	-2.6	4.7	-0.6	0.58	-11.9	6.7
Accreditation of Orphanages						
A (ref)						
B	9.0	6.6	1.4	0.17	-4.1	22.1
C	3.6	6.8	0.5	0.60	-9.9	17.1
Unaccredited	6.4	6.5	0.9	0.32	-6.4	19.2
Female						
Age						
13-15 Years (ref)						
16-18 Years	1.7	3.3	0.5	0.59	-4.8	8.2
Education						
Junior High School (ref)						
Senior High School	-2.9	3.6	-0.8	0.43	-10.1	4.3
Religion						
Islam (ref)						
Protestant	8.8	4.3	2.0	0.07	0.2	17.5
Catholicism	5.9	5.2	1.1	0.26	-4.6	16.2
Orphan Status						
Not Orphan (ref)						
Maternal Orphan	-3.7	4.3	-0.8	0.40	-12.3	4.9
Paternal Orphan	0.9	2.9	0.3	0.75	-4.8	6.7
Double Orphan	-2.3	3.8	-0.6	0.56	-9.9	5.3
Living in Orphanages						
1-3 Years (ref)						
4-5 Years	0.1	3.4	0.0	0.99	-6.8	6.8
More than 5 Years	-1.3	2.9	-0.4	0.67	-7.2	4.6
Accreditation of Orphanages						
A (ref)						
B	1.9	4.2	0.5	0.65	-6.4	10.2
C	-4.7	4.9	-0.9	0.35	-14.5	5.2
Unaccredited	5.7	4.5	1.3	0.21	-3.3	14.6

* $p < 0.05$

Based on multiple regression analysis, age was the only sociodemographic variable significantly associated with HRQoL among male adolescents; higher age corresponded to lower HRQoL ($\beta = -5.5$, $p < 0.05$). In contrast, no sociodemographic characteristics were significantly associated with HRQoL in female adolescents living in orphanages (Table 3).

DISCUSSION

This study aimed to assess gender-based differences in HRQoL among adolescents living in orphanages and to identify factors associated with their HRQoL.

This study uses Bronfenbrenner's Ecological Systems Theory as its framework (Bronfenbrenner, 1979). The orphanage serves as a critical structural determinant and immediate microsystem. Within this environment, proximal social processes and care conditions directly dictate physical and psychological well-being. Furthermore, the investigation of gender-based variances is grounded in the broader macrosystem, which shapes how societal gender roles and expectations intersect with institutional realities to distinctively influence male and female HRQoL profiles.

This study found that the total score of HRQoL in females was significantly lower than in males including the dimensions of

physical well-being and psychological well-being. However, there were no differences in the dimensions of parents and autonomy, social support and peers, or school environment.

Although studies on HRQoL among orphanage-dwelling adolescents living in orphanages are limited, research in the general adolescent population consistently reports lower HRQoL in females compared to males (Boraita et al., 2020; Langeland et al., 2019; Meade & Dowswell, 2016; Mikkelsen et al., 2020; Otto et al., 2017). The present findings align with an Australian study using the KIDSCREEN-27 instrument, which also found that girls scored lower on physical and psychological well-being (Meade & Dowswell, 2016). However, that study additionally reported differences in autonomy and parent-relations, which were not observed in our findings. While this study did not directly assess clinical or physiological markers, existing literature suggests that the onset of pubertal transitions in female adolescents is frequently associated with broader physical and psychological vulnerabilities (Khetan et al., 2024; Maqbool et al., 2022). During puberty, surges in estradiol, luteinizing hormone (LH), and follicle-stimulating hormone (FSH) drive sexual maturation and the onset of the menstrual cycle (Khetan et al., 2024). When these hormonal changes become dysregulated, disorders such as menorrhagia and other menstrual problems may arise. Symptoms including cramps,

fatigue, and mood changes can decrease participation in daily activities at school and in sports (Maqbool et al., 2022).

Regarding psychological well-being, the present findings align with a previous Malaysian study that reported higher levels of stress, anxiety, and depression among female adolescents living in orphanages (Jaffer et al., 2023). Possible explanations for this disparity include hormonal and neurodevelopmental changes during puberty, gender-role expectations that limit empowerment within institutional settings, and gender-based neglect or relational abuse that undermine perceived safety and peer support (Foradada-Villar & Sala-Roca, 2025). Moreover, females tend to experience greater psychological distress, whereas males may report lower stress but exhibit higher levels of problem-behavior (Li et al., 2024). Nonetheless, some research suggests that cultural background can attenuate these sex differences and that individual resilience plays a pivotal role in shaping the mental-health outcomes of orphaned adolescents (Yoon et al., 2023).

The absence of gender differences in the remaining HRQoL dimensions aligns with findings from a study on adolescents with high myopia, which also reported no significant gender gaps in autonomy and parent-relationships, peers and social support, or school environment (Zawistowska et al., 2024). The autonomy and parent relationships dimension of HRQoL assesses family dynamics, a sense of love and acceptance, decision-making ability, and identity (Eriksson et al., 2022). In this dimension, the development of autonomy during adolescence is influenced significantly by cultural and parental factors (Beyers et al., 2025). Relationships between parents and adolescents typically evolve toward more peer-like qualities, although this connectedness remains stable throughout the lifespan (Budiarto et al., 2026). In orphanages, the absence of traditional parent-child dynamics may result in similar autonomy development for both genders. Autonomy-limiting behaviors by parents can lead to dependency in emerging adulthood; however, such behaviors are less prevalent in orphanages, potentially resulting in comparable autonomy outcomes for males and females (Shah et al., 2023).

Peers and social support encompass the frequency of contact, feelings of acceptance, and the ability to maintain friendships (Befus et al., 2023). Although females often report lower social support in community settings, the shared experiences within orphanages can standardize peer interactions, leading to similar levels of social support across genders (Caserta et al., 2017; Foradada-Villar & Sala-Roca, 2025). This highlights the unique dynamics within orphanages that can mitigate the typical gender gap in social support.

The school-environment dimension evaluates attitudes toward school, emotional responses, motivation, concentration, academic performance, and teacher-child interactions (Befus et al., 2023). Studies have shown that adolescents generally perceive equal treatment by teacher, which may reduce gender-based disparities in this domain (Singh & Thapa, 2023). When teachers consistently set fair expectations and provide balanced support, students feel safer and more confident in their school environment. This sense of safety directly supports and improves school functioning for both genders.

Age was the only factor associated with HRQoL in male adolescents, with higher age correlating with lower the HRQoL. This finding is in line with previous research

indicating that HRQoL tends to decline as adolescents grow older (Le et al., 2021). This pattern may reflect the increasing complexity of psychosocial demands and identity development during late adolescence, which can challenge emotional well-being and life satisfaction.

In contrast, no sociodemographic factors were found to be associated with HRQoL in female adolescents. This lack of association suggests that personal and environmental factors—such as social support, perceived health status, self-esteem, and emotional resilience—may play a more dominant role in shaping their quality of life than background characteristics (Chu-Ko et al., 2021; Mikkelsen et al., 2022; Singstad et al., 2021).

This study appears to be the first to explore gender differences in HRQoL among adolescents residing in Indonesian orphanages. Participants were recruited from multiple institutions representing diverse environments. Several limitations of this study are as follows: the cross-sectional design precludes any inferences regarding causality among variables; convenience sampling restricts the generalizability of our findings to the broader population; the interviewer-assisted administration method may have introduced social desirability bias; reliance on self-reported questionnaires may subject the data to reporting biases; and the potential for residual confounding from unmeasured variables remains.

CONCLUSION AND RECOMMENDATION

Female adolescents in Indonesian orphanages had lower HRQoL scores than their male counterparts, particularly in the physical and psychological well-being dimensions. Among male adolescents, only age was significantly associated with HRQoL, while no factors were found to be associated with HRQoL among female adolescents in Indonesian orphanages.

These findings highlight the need for gender-sensitive policies and interventions in Indonesian orphanages, particularly programs aimed at improving the physical and psychological well-being of female adolescents. Future research should investigate the specific factors influencing HRQoL in this population and utilize longitudinal designs to assess causal pathways.

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