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Predictors of Bullying and Physical Health in Institutionalized Children: A Pakistani Perspective

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ABSTRACT

This research examined the influence of physical health of the orphanage children in Pakistan on bullying and institutionalization duration. A purposive sample (n= 600 children 300 males, 300 females) aged 10-19 years, in orphanages in Gujrat, Gujranwala and Lahore were used to administer a cross-sectional correlational design. The bullying tendencies in the children were measured using illusion bullying scale. The findings revealed that, males scored a great deal higher in fighting and victimization relative to females. In addition, it was found that there were significant variations in bullying by weight with children of 20-39 kg having the highest bullying scores. There was also dissimilarity in victimization on the basis of health condition, yet not institution length. Chi-square analysis revealed that health condition and stay duration, and weight and stay duration were significantly related. The results indicate the necessity of specific psychosocial and health educational interventions in the institutional care environment.

Introduction

World health organizations, including the World Health Organization (WHO), the Centers for Disease Control and Prevention (CDC), and UNESCO, are all starting to identify bullying as one of the most important issues impacting the mental, social, and physical health of children in the long term (WHO, 2023; Craig et al., 2023; UNESCO, 2023). Globally, it has been estimated that around 30 percent of children are bullied at some point in their education, which indicates that it is a global issue cutting across cultures and social economic backgrounds (Sainz & Martin-Moya, 2023). The aftereffects do not only happen in childhood but also in academic performance, emotional regulation, and health well into adulthood (Espelage and Hong, 2022; Kowalski and Limber, 2021).

Bullying has also been a prominent subject of research in Pakistan, mainly in formal schools and colleges, and little has been carried out in institutional care institutions on children. A study carried out at Lahore revealed that 44 percent of children who are in school attested to being bullied (Tariq et al., 2018). Nevertheless, children residing in orphanage can be in even greater danger, as they lack the protection of their parents, overcrowded places to stay, and a solid support system of emotional support (Scannapieco and Connell-Carrick, 2021). Such settings tend to affirm the hierarchies of peer dominance, and these tendencies may support bullying tendencies and impact the well-being of children adversely (Aamir et al., 2024).

Bullying can be defined generally as the purposeful repetitive aggression, which includes imbalance in power between the aggressor and the victim (Olweus, 1993; Volk et al., 2017). It appears in various ways, such as verbal harassment, physical violence, social exclusion as well as cyber bullying. Cyber bullying is especially common now, due to the emergence of digital technologies, and it makes victims not only institutionalized but also beyond the institution (Smith et al., 2023; Livingstone et al., 2022). Children are extremely susceptible to such aggression in institutional care where supervision is usually low (Ayub and Malik, 2020).

The impact of bullying on institutionalized children has far reaching ramifications. Psychosomatic complaints (headaches, gastrointestinal problems, and fatigue) and increased morbidity with regard to depression and anxiety and suicidal thoughts are frequent complaints reported by victims (Modecki et al., 2022; Copeland et al., 2021). The perpetrators can also become vulnerable to long-term challenges, such as antisocial behavior and poor social adjustment (Kowalski and Limber, 2021). Bullying in the orphanage setting will be explained by structural issues, including caregiver-to-child and staff training rates and lack of access to healthcare, which augment its detrimental consequences (Biehal et al., 2020).

These risks are further aggravated by the length of time in institutionalization. Based on the Bucharest Early Intervention Project and later longitudinal research, we have clear evidence that prolonged institutional care is linked to delayed physical development, poor neurological development, and poor social integration (Nelson et al., 2014; Ludyga et al., 2024). Long-term institutionalization changes the brain structures of emotion regulation and executive functioning (Bick et al., 2017), and increases the susceptibility to chronic diseases, malnutrition, and infections (Zeanah et al., 2019). Thus, the intersection of bullying and length of institutionalization presents a pressing but understudied child welfare issue, particularly in low-resource settings such as Pakistan.

Literature Review

Different authors have conceptualized bullying as a multidimensional process that is recurring, intentional, and power imbalanced (Olweus, 1993; Smith et al., 2023). Researchers separate direct bullying, including physical harassment and verbal abuse, and indirect bullying, including social exclusion and rumor-spreading, which are as harmful as the first one (Gladden et al., 2014). In recent years, the problem of indirect bullying has received growing attention because it is subtle and widespread (Bjorkqvist and Osterman, 2012). A new type of indirect aggression, cyberbullying, increases the scope of peer victimization, and the research has proven that it has high levels of correlation with anxiety, depression, and suicidal ideation (Pacer, 2022; Modecki et al., 2022). In Pakistan, children are exposed to online bullying, more so in unsupervised institutional settings, due to the rapid digitalization in the wake of COVID-19 (Ayub and Malik, 2020).

Several psychological and developmental theories provide explanatory frameworks for bullying. Bandura's Social Learning Theory emphasizes that aggression is learned through observation and reinforcement, a process particularly relevant in orphanages where children often mimic peers or even caregivers (Bandura, 1986; Venkatesh & Kumar, 2021). Social Cognitive Theory highlights the interplay between personal, behavioral, and environmental factors in sustaining bullying (Orpinas & Horne, 2006). Cognitive distortion theories further explain how bullies rationalize their actions through blame-shifting and minimization (Peters et al., 2023). At the ecological level, Bronfenbrenner's Ecological Systems Theory positions bullying within interconnected social systems, including peer groups, institutional climates, and broader cultural norms (Bronfenbrenner, 1979).

Children in institutional care are particularly vulnerable due to factors such as high caregiver turnover, overcrowding, and limited psychosocial support. Studies in Pakistan reveal that over 30% of institutionalized adolescents exhibit behavioral issues linked to bullying experiences (Khurshied, 2016; Khizar et al., 2024). Globally, prevalence rates vary widely, with reports from South Asia suggesting bullying victimization between 4% and 95% (Srinivasan et al., 2022). In China, 40.62% of left-behind children reported experiences of bullying, illustrating the heightened risks faced by socially marginalized youth (Yan et al., 2024).

Bullying is increasingly associated with adverse physical health outcomes. Victimized children frequently report somatic symptoms, sleep disturbances, and reduced immunity due to chronic stress (Craig et al., 2023; Huang et al., 2022). In Pakistan, orphaned children demonstrate high rates of malnutrition and stunted growth, conditions exacerbated by peer victimization and inadequate health care (Riaz et al., 2021; Aziz et al., 2023). Extended institutionalization amplifies these risks. Neurodevelopmental studies confirm that children who remain in institutional settings for prolonged periods show altered cortisol regulation, weakened immune responses, and increased vulnerability to chronic diseases (Behen et al., 2020; Hostinar & Gunnar, 2020).

Global responses to bullying provide useful models but are rarely adapted to orphanage settings. However, school-based programs like the Olweus Bullying Prevention Program and the KiVa project in Finland have proven to be effective at decreasing bullying (Salmivalli et al., 2021), yet they are not implemented in low-resource institutional settings so far. The Nurturing Care Framework of UNICEF focuses on responsive caregiving, nutrition, and emotional support, which is usually lacking in orphanages (Black et al., 2021). The recent studies outline the necessity of providing combined interventions that would include the inclusion of staff training, trauma-informed care, and the system of peer support to reduce the dual threat of bullying and extended institutionalization (Coppola et al., 2020; Saxena et al., 2019).

Irrespective of such difficulties, resilience is a significant protective factor. Resilient children are characterized by the capacity to adjust and remain healthy even when the situation goes bad (Masten, 2014). The adverse effects of bullying can be offset by protective factors such as supportive peer relationships, educational opportunities, warmth of caregivers, and cultural or spiritual resources (Liebenberg et al., 2016; Theron and Theron, 2019). Nevertheless, the orphanages in Pakistan tend to be untrained and well-organized. Staff are rarely trained in trauma-informed care, which leads to inconsistent discipline and environments where bullying thrives (Mahar, 2021; Berger et al., 2022). Gender norms shape bullying dynamics, as boys are more likely to engage in overt aggression, whereas girls often resort to relational forms of bullying (Craig et al., 2023). Children who do not conform to traditional gender roles, including those from

sexual and gender minority groups, face an even greater risk of victimization (Ahmed & Latif, 2023; D'Cruz & Noronha, 2021).

Hypothesis of the study

Following are the hypothesis of the study
H1: There is likely correlational relationship between bullying and physical health in children of orphanage.
H2: There is likely relationship between bullying and the length of institutionalization in the children of orphanage.
H3: Bullying and length of institutionalization will predict the physical health.

Methods

This study utilized a cross-sectional correlational research design to investigate the relationship between bullying, physical health, and length of institutionalization among orphanage children in Pakistan.

Participants and Procedure

The sample of 600 adolescents (341 males and 259 females), aged 10 to 19, was selected from orphanages in Gujrat, Gujranwala, and Lahore through non-probability purposive sampling. Participants were categorized into early (10–12 years), middle (13–15 years), and late adolescence (16–19 years) stages aligned with WHO classifications. G*Power analysis established the required sample size. Inclusion criteria comprised children aged 10–19 who had been residents of orphanages for at least one month and were capable of comprehension and participation in assessments. Exclusion criteria ruled out those under 10 or over 19, individuals with disabilities impeding participation, non-institutionalized children, and those lacking consent. Data collection involved a demographic questionnaire to gather age, gender, education, stay duration, weight, and health status, and the Urdu version of the Illusion Bullying Scale (18 items across three subscales) was employed. Ethical approval was secured, ensuring participant confidentiality and informed consent. Data analysis used IBM SPSS (Version 24), applying descriptive statistics, t-tests, ANOVA, chi-square tests, and neural network analysis, while reliability was confirmed using Cronbach's alpha. Predictive relationships among variables were assessed through regression and neural network modeling.

Results

Table 1

Frequencies and Chi-Square Results for Health Condition and Stay Period (N = 600)

Source	1Day-3Years		3Y-1D-7Years		7Y-1D-10Years and above		x^2 (1)	Sig
	n	%	n	%	n	%		
Not at all	229	38.166	151	25.166	66	11.0	18.604[a]	.001
Mildly Ill	62	10.33	36	6.0	7	1.167		
Severely Ill	39	6.5	8	1.33	2	0.33		

***$p < .001$.

The table 1 shows the association between health condition and stay period. The results indicate that the majority of respondent (38.166%) with fewer in the longer stay period and reporting "not at all ill" on the health condition. The smaller portion (10.33%) reported "mildly ill". The value of Chi- square is 18.604 and the p value is .001 that suggests a strong association between health condition and length of institutionalization, this means that the health condition is significantly related to the length of institutionalization in the orphanage.

Table 2

Frequencies and Chi-Square Results for Weight and Stay Period (N = 600)

Source	1Day-3Years		3Y-1D-7Years		7Y-1D-10Years and above		x^2 (1)	Sig
	n	%	n	%	n	%		
20kg-39kg	206	34.33	65	10.833	12	2.0		
Above 39kg-55kg	109	18.166	119	19.833	47	7.833	91.270[a]	.000
Above 55kg-75kg and above	15	2.5	11	1.833	16	2.66		

***$p < .001$.

The table 2 shows the association between weight and the length of stay period. The results indicate that the majority of respondent (34.33%) fall 20kg-39kg weight category with fewer in the longer stay period. The smaller portion (2.0%) reported long stay period. The value of Chi- square is 91.270 and the p value is .001 that suggests a significant association between weight and length of institutionalization.

Table 3

Predictor association among bullying total and independent variables based on training and testing errors

Data Set	Relative Error	
	Training	Testing
Bullying Total	.982	.999

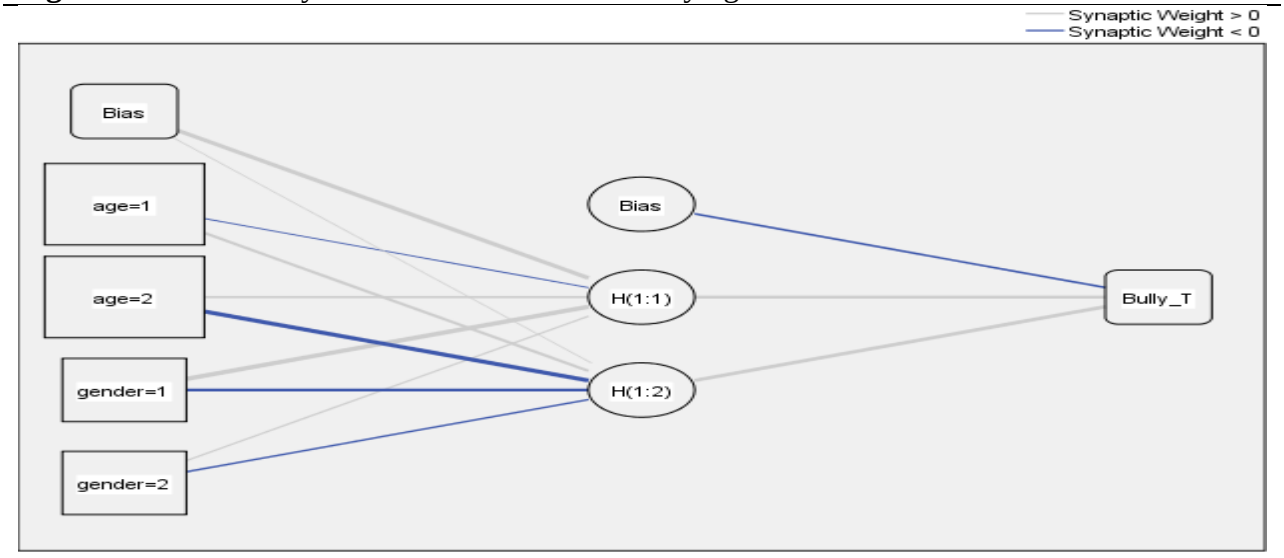
Table 4

Predictive importance of independent factors

Variables	Importance	Predictive Importance
Age	.600	100.0%
Gender	.400	66.5%

Table 4 shows that the prime predictor of Age .600 (100% normalized importance) followed by gender .400 (66.5% normalized importance) as the proportion indicated. The results show that the age indicating a more significant role in predicting the outcome. Age has significant more influence on the model's predictions than gender. And age is also the primary driver of the model's prediction and gender providing less contribution.

Figure 1.1- Hidden layer activation function of bullying total



The diagram 1.1 shows the prediction model. The age and gender are administrated through hidden layers before reaching the final prediction. The gray lines show positive influence that meaning age and gender has positive influence of bully total while the blue lines show the negative influence meaning those inputs decrease the likelihood.

Figure 1.2- Normalized importance of independent variables

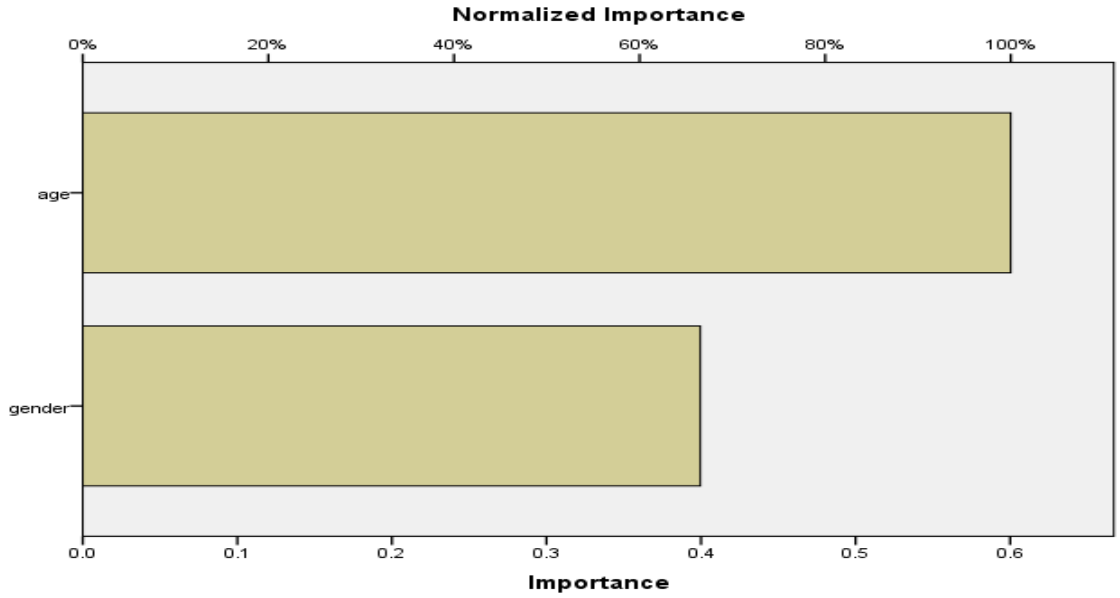


Figure 1.2 shows the importance of age and gender in predicting outcome. Age has a higher importance value as compared to gender that means it play a bigger role in the model's prediction. The bar chart is normalized and it show their relative significance.

Table 5
Predictor association among bullying total and independent variables based on training and testing errors

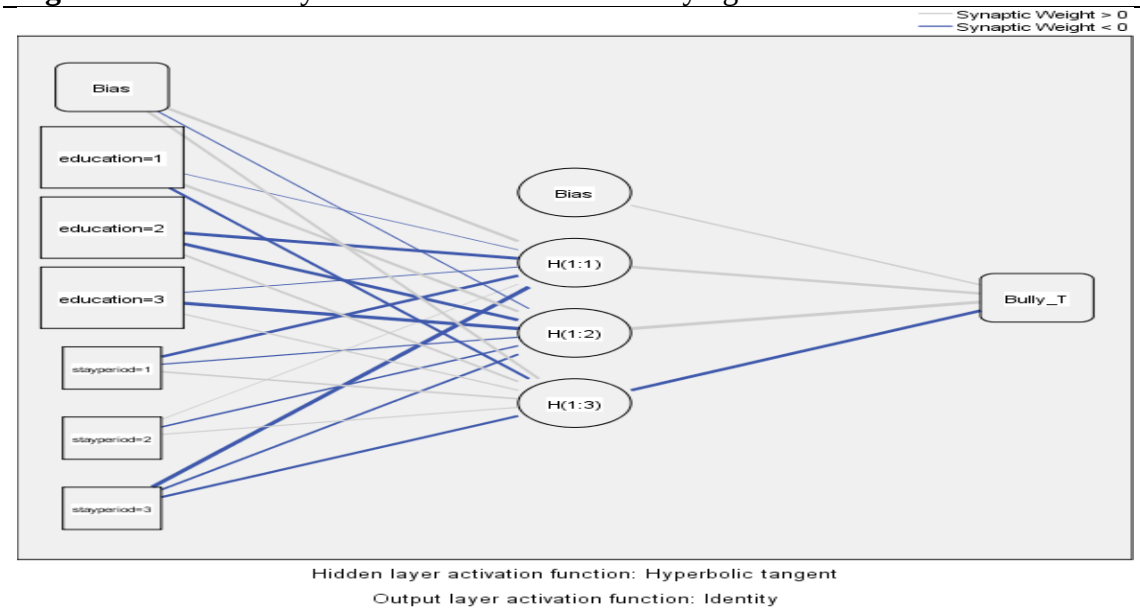
Data Set	Relative Error	
	Training	Testing
Bullying Total	.969	.933

Table 6
Predictive importance of independent factors

Variables	Importance	Predictive Importance
Education	.797	100.0%
Stay Period	.203	25.5%

Table 6 shows that the prime predictor of Education .797(100% normalized importance) followed by stay period .203(25.5% normalized importance) as the proportion indicated. The results show that education has a significant greater influence on the model's predictions than stay period. And education is also the primary driver of the model's prediction and stay period providing only a minor contribution.

Figure 1.3- Hidden layer activation function of bullying total



The diagram 1.3 shows the prediction. The education and stay of period are administrated through hidden layers before reaching the final prediction. The gray lines show positive influence that meaning education and stay of period has positive influence of bully total while the blue lines show the negative influence meaning those inputs decrease the likelihood. The overall result shows that education has a significant greater influence on the model's predictions than stay period.

Discussion

The findings of the present study provide important insights into the relationship between bullying, fighting, health status, and the length of institutionalization among children living in orphanages.

As shown in Table 1, boys were more frequently engaged in physical fighting and were more often victimized compared to girls. This gender difference is consistent with global evidence indicating that boys are more likely to participate in overt forms of aggression, while girls are more commonly involved in relational aggression (Craig et al., 2023). Similarly, recent WHO surveillance across Europe confirmed that physical fighting and traditional bullying are consistently more prevalent among boys during early to mid-adolescence (WHO Regional Office for Europe, 2026). This could be attributed to gendered socialization habits where aggressive acts are normalized among boys where boys are at a higher risk of victimization and other untold outcomes in regard to adverse health. As we can see, per this, 2024 CDC report also noted that victims of physical bullying display more anxiety and depression, which, again, supports the importance of our gender-specific results (Centers for Disease Control and Prevention [CDC], 2024).

A second notable result, which is in Table 2, was that weight status was significantly correlated with bullying and fighting. Underweight and overweight children were more likely to report victimization than average-weight children. These findings are consistent with a meta-analysis study carried out by García-Hermoso et al. (2022), who established that victims of bullying are almost twice as many among children with obesity. On the same note, Kim et al. (2020) established that overweight or obese adolescents were more likely to be bullied and those who bullied others. Additional evidence that is more recent demonstrates that weight-based victimization has grown into the online sphere, where weight-based cyberbullying has become a significant psychosocial issue (Puhl et al., 2025). Interestingly, boys of underweight have also been determined to be targeted disproportionately in schools, which adds weight to the U-shaped risk pattern in our data (Zhao et al., 2025). Taken together, these results suggest that body image and weight still play a salient role in peer victimization, and there is a strong need to employ weight-sensitive prevention strategies in the residential care environment.

Children who had a pre-existing health problem and those who spent more time in institutional care had more health-related problems in Table 3. The result reflects the current studies that have been carried out in Punjab, Pakistan, where children in an orphanage were reported to be stunted, anemic, and underweight (Hussain et al., 2025). It was also reported in international studies that the cumulative risks of poor nutrition, development and psychosocial outcomes are commonly linked to longer exposure to institutional conditions, especially in the low- and middle-income countries (van Ijzendoorn et al., 2020). Follow-ups studies also demonstrated by Bucharest Early Intervention Project (BEIP) that children brought up in long-term institutions are more exposed to poor growth and delayed health than those picked up earlier in family-based care (Nelson et al., 2021). These overlapping results underscore the importance of institutional circumstances in the development of the health pathways of children.

Interestingly, the outcome presented in Table 4 suggested no significant correlation between the institutionalization length and victimization by bullying. This result is interesting because the previous studies on residential youth care have reported inconclusive results. Although it is stated that longer stays increase exposure to aggression, other studies indicate that the duration of stay is not the most significant factor influencing the presence of aggression but rather contextual factors, including climate of the facility, staffing patterns, and composition of peers (Braga et al., 2017; van der Helm et al., 2018). More recent studies of Pakistani orphanages including the Aghosh Homes study have also noted that institutional quality and caregiver practices are protective of bullying irrespective of the duration of placement (Aghosh Homes, 2025). Hence, the null results could indicate that the institutional context is greater than time in explaining victimization risk.

Finally, the predictive modeling results presented in Table 5 showed that gender, age, education, and stay period were among the most important predictors of bullying and health-related outcomes. These findings align with international evidence demonstrating that bullying and fighting behaviors peak in early adolescence (ages 11–15) before gradually declining (WHO Regional Office for Europe, 2026). Gender consistently remains a strong predictor, with boys being at higher risk of overt aggression (Craig et al., 2023). The role of education and stay period, as highlighted in our neural network model, may reflect both developmental stages and cumulative exposure to institutional conditions. These results emphasize the importance of tailoring prevention and intervention strategies according to developmental stage and gender, while also addressing systemic factors within institutions.

Conclusion

This study explored the connection between bullying, physical health, and institutionalization duration among Pakistani orphans. It found significant links between gender and body weight with bullying behaviors, while institutional stay length was not a predictor. Males showed higher fighting and victimization rates, and those in the 20–39 kg weight range were more involved in bullying. Utilizing both traditional (t-tests, ANOVA) and advanced statistical methods (neural networks), the research identified key variables like age, education, and weight, emphasizing the need for targeted interventions considering individual vulnerabilities and institutional structures. Chi-square analysis highlighted significant associations between health condition and stay duration, as well as between weight and stay duration, indicating that prolonged institutionalization is linked to poorer health outcomes and lower weight categories.

Limitations and Recommendations

The study has notable limitations, including reliance on self-reported data, which may introduce bias and underreporting on sensitive matters like bullying. Its cross-sectional design restricts causal interpretations, suggesting a need for longitudinal studies to better understand the long-term impacts of institutionalization and bullying on children's health. The sample sourced from three cities in Punjab limits the generalizability of findings to the overall population of institutionalized children in Pakistan, as regional variations in policies and interactions could influence results. Moreover, key psychological factors such as trauma history and coping mechanisms were not evaluated, which could have provided additional insights. While a neural network analysis identified key predictors, machine learning output interpretations remain limited without qualitative context.

Recommendations include implementing gender-sensitive programming in orphanages to address the higher incidence of physical bullying among boys and promote non-violent conflict resolution. Regular health assessments and nutritional support are vital for underweight children, as they are often more involved in bullying. Caregivers should receive training to recognize bullying signs and apply trauma-informed strategies. Psychoeducational interventions to enhance social skills, self-esteem, and emotional regulation are crucial, especially for new arrivals. Lastly, child welfare bodies should enforce standardized guidelines and thorough research should incorporate qualitative approaches and longitudinal designs to capture the evolving experiences of children in these settings.

Implications

The study presents significant implications across theoretical, practical, and policy dimensions. Theoretically, it validates socio-ecological models, highlighting personal and environmental influences on behavior and emphasizing peer dynamics in bullying over duration of exposure. Practically, it equips orphanage administrators and social workers with indicators to identify at-risk children, advocating for proactive engagement and preventive strategies to mitigate bullying. At the policy level, it calls for enhanced investment in the wellbeing of children in state-run institutions, urging government and NGOs to adopt bullying prevention and child protection protocols as standard practice. Overall, the research lays the groundwork for transformative change in Pakistan's institutional care system, promoting healthier environments for orphaned children's holistic development.

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