

ASSESSMENT REPORT

Role of Access to

Outdoor Playground

on children's Physical and
Mental Health;

A study in Khulna City



ACTIVE
CHILDREN



HEALTHY
MINDS



STRONGER
COMMUNITIES

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**Green Resilience & Cooperation
For Ecosystem (GRACE)**

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About GRACE:

Green Resilience and Cooperation for Ecosystem (GRACE) is a non-governmental, non-political, and rights-based development organization working in the south-west coastal region of Bangladesh. The organization is committed to improving the lives of climate-vulnerable, marginalized, and disadvantaged communities through participatory, inclusive, and sustainable development approaches.

GRACE has been working for more than 12 years, originally operating under the Department of Social Services (DSS) before its formal registration with the NGO Affairs Bureau (NGOAB). Over time, it has evolved into a structured development organization focusing on climate resilience, social justice, and sustainable community development.

The organization works across key thematic areas including climate change adaptation, disaster risk reduction (DRR), health, nutrition, water and sanitation (WASH), education, youth development, women's empowerment, and sustainable livelihoods. GRACE places strong emphasis on strengthening community resilience and improving access to basic services in climate-affected and underserved areas.

GRACE also integrates global and national development priorities, aligning its interventions with the Sustainable Development Goals (SDGs), the Sendai Framework for Disaster Risk Reduction, and other relevant policy frameworks. Its approach is community-driven, ensuring active participation of local people in planning, implementation, and monitoring of development activities.

The vision of GRACE is to build a just, equitable, and resilient society where vulnerable populations can live with dignity and security. Its mission is to empower communities through rights-based, collaborative, and sustainable development initiatives in partnership with government agencies, civil society organizations, and development partners.

GRACE is headquartered in Khulna, Bangladesh, and implements programs across multiple climate-vulnerable areas in the south-west region, working to enhance resilience, promote sustainable livelihoods, and support long-term community development.

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Contents

Acknowledgement	Error! Bookmark not defined.
List of Tables.....	6
List of Figures.....	7
Acronyms	8
Abstract.....	9
Chapter one: Introduction	10
1.1 Background of the Study:	10
1.2 Research Objectives.....	12
1.3 Research Questions	13
1.4 Hypothesis Formulation	13
1.5 Significance of the Study	14
1.6 Limitations of the Study	15
Chapter two: Literature Review.....	16
2.1 The Role of Playgrounds in Children's Mental and Physical Development....	16
2.2 Effect of Playground and Socio-Environmental Factors on Mental and Physical Health and Development.....	17
2.3 Research Gap	18
Chapter three: Methodology.....	22
3.1 Theoretical Background	22
3.2 Conceptual Framework.....	22
3.3 Data and Variables:.....	25
3.4 Sampling Technique and Data Collection Procedure	32
3.5 Empirical Analysis	34
3.6 Analytical Tools	35
Chapter Four: Result and Discussion	36

4.1 : Socio-Demographic Information.....	36
4.2: Access to Playground.....	44
4.3: Physical Activity & Physical Development.....	48
4.4: Mental Health & Psychosocial Well-Being.....	54
Chapter Five: Key Findings, Recommendation and Conclusion	69
<i>5.1 Key Findings of the Study.....</i>	69
<i>5.2 Recommendations</i>	72
<i>5.3 Conclusion.....</i>	73
References	74

List of Tables

- Table-01: List of variables (dependent and independent)
- Table-02: Sample size and percentage (%)
- Table-03: Data Collection Technique with plan
- Table-04: Religion of the respondent
- Table-05: Age Distribution of the children
- Table 6: Age at Initiation of Formal Education Among Children
- Table-07: Access to Playground within 400 meters
- Table-08: BMI-for-Age Z-Score distribution of the children
- Table-09: BMI-for-Age Z-Score distribution of the children among with access and without access to playground
- Table-10: Mental wellbeing comparison
- Table-11: Comparison of Emotional Wellbeing of the children
- Table-12: Comparison of Behavioral & conduct Aspect
- Table-13: Comparison of Peer Relationship & Social Skills
- Table-14: Comparison of Cognitive & Emotional Regulation
- Table-15: Comparison of Average daily screen time (TV/Phone/Smart phone/tablet)

List of Figures

- Figure 1: Diagram of Conceptual Framework
- Figure 2: Diagram of Enhanced Children Development
- Figure 3: Data measurement systems
- Figure 4: Area of data Collection
- Figure 5: Study Area Map
- Figure 6: Distribution of Gender of the children
- Figure 7: Distribution of currently educating of the children
- Figure 8: Distribution of education by Class
- Figure 9: Distribution of educational Level of children's mother
- Figure 10: Distribution of the percentage of children (aged up to 18 years)
- Figure 11: Distribution of Monthly Family Income
- Figure 12: Distribution of Living condition of the Households
- Figure 13: Distribution of children access to playground within 400 meters
- Figure 14: Distribution of types of the playground
- Figure 15: Distribution of average duration per visit
- Figure 16: Distribution of Types of activities performed during playground visit
- Figure 17: Picture of Children's Activity
- Figure 18: Child engages in moderate to vigorous physical activity in the last week
- Figure 19: Type of Physical activity per day in the last week
- Figure 20: Association of access to playground and nutritional status
- Figure 21: Growth Concern by Health Worker/department (%)
- Figure 22: Distribution of guardian's opinion on physical fitness
- Figure 23: Mental Wellbeing indicator by access to playground
- Figure 24: Distribution of Mental wellbeing by access to playground
- Figure 25: Distribution of Cognitive & Emotional wellbeing
- Figure 26: Average daily digital screening time
- Figure 27: Status of screen time influencing outdoor play
- Figure 28: Opinion on whether the neighborhood is safe for children
- Figure 29: Playground environment supports children's mental well-being
- Figure 30: Using playground barrier to children
- Figure 31: Overall Physical and mental well-being of child opinion by mother/guardian of child's

Acronyms

GRACE-Green Resilience & Cooperation For Ecosystem

KU – Khulna University

WHO – World Health Organization

FGD – Focus Group Discussion

DRR – Disaster Risk Reduction

CFC – Child-Friendly Community

UNICEF – United Nations Children’s Fund

SDGs – Sustainable Development Goals

COVID-19 – Coronavirus Disease 2019

MD – Mental Development

PD – Physical Development

PA – Playground Access

NAP – No Access to Playgrounds

AP – Access to Playgrounds

SD – Standard Deviation

SPSS – Statistical Package for the Social Sciences

BD – Bangladesh

Abstract

This study aims to investigate the mental and physical development of children with and without access to playground facilities in Khulna, Bangladesh. Recognizing the growing urbanization and limited availability of safe recreational spaces, the research examines how access to playgrounds influences children's cognitive growth, emotional well-being, social interaction, and physical health outcomes.

The study collected data from a total of 200 children, between those with access to playgrounds and those without access. The participants included boys and girls aged 4–10 years residing in selected urban neighborhoods of Khulna. In addition, parents or guardians of children aged 36 months living in the same areas were also included to gather complementary information regarding early childhood development and environmental influences.

A convenient sampling technique was employed to select respondents, and data were collected using a structured questionnaire. The research adopted a quantitative approach, integrating quantitative survey data. This combination allowed for a comprehensive and holistic understanding of children's physical activity levels, behavioral patterns, emotional stability, social skills, and overall developmental outcomes in relation to playground accessibility.

The findings of this study are expected to highlight the significant role of accessible recreational spaces in fostering healthy child development and to provide evidence-based recommendations for urban planning and child-centered policy interventions in Khulna.

Keywords:

Access to Playground; Urban Children; Recreational Facilities; Child Well-being.

Chapter One: Introduction

1.1 Background of the Study:

Mental and physical health together constitute the foundation of overall human well-being, encompassing the effective functioning of the body and mind, healthy lifestyle practices, disease prevention, and meaningful social participation. In childhood, these dimensions are profoundly interconnected. Evidence suggests that poor mental health increases vulnerability to chronic physical illnesses, while physical inactivity can negatively influence psychological well-being, emotional stability, and cognitive performance (Cadman et al., 1987; Whiney et al., 2019). Consequently, children's mental and physical health has emerged as a critical global public health priority. The World Health Organization (WHO, 2022) defines mental health as a state of well-being in which individuals can cope with life's stresses, realize their abilities, and contribute productively to society. Similarly, physical health is understood as a dynamic condition involving the development and maintenance of biological, physiological, and functional capacities that support active living and social engagement (Koipysheva et al., 2018).

Regular physical activity during childhood plays a decisive role in establishing lifelong health behaviors and enhancing long-term physical and mental outcomes (Rowland & Freedson, 1994; Ha et al., 2019; Ługowska et al., 2023). Physical activity supports motor development, strengthens musculoskeletal systems, reduces the risk of obesity and non-communicable diseases, and improves concentration, emotional regulation, and social competence (Biddle et al., 2004; Benzing & Schmidt, 2018). In this regard, access to safe outdoor environments and structured or unstructured play spaces is fundamental for children's holistic growth.

However, rapid urbanization and environmental transformation have significantly altered children's lifestyles across the globe. Expanding urban density, unplanned infrastructure, traffic congestion, and shrinking green spaces have reduced opportunities for outdoor play and physical activity. Scientific evidence consistently demonstrates that parks and community-based green spaces mitigate the negative effects of dense urban living and foster healthier developmental outcomes (Bedimo-Rung et al., 2005; Vliet & Karsten,

2015; Wilson, 2022). The Child-Friendly Community (CFC) framework, promoted by UNICEF, emphasizes municipalities' responsibility to ensure environments that uphold children's rights to health, safety, play, and social inclusion (UNICEF, 2018; Enns & Kombe, 2023). Accessible playgrounds and neighborhood parks—particularly those within walkable distances—provide restorative environments that enhance physical fitness, emotional resilience, social interaction, creativity, and problem-solving skills (Shieh & Chang, 2014; Mani et al., 2012).

Global studies indicate that children with access to nearby green spaces report lower levels of anxiety and depression and demonstrate higher levels of physical activity, cognitive engagement, and social participation (Rigolon, 2018; Alderton et al., 2022). Conversely, children deprived of safe recreational environments are more likely to experience sedentary behavior, social isolation, and psychological distress. The COVID-19 pandemic further underscored these vulnerabilities, as lockdowns and school closures significantly reduced outdoor activity and peer interaction, leading to increased anxiety, depression, sleep disturbances, and physical inactivity among children worldwide (Pedrosa et al., 2020; Hossain et al., 2022).

In Bangladesh, rapid urban expansion has intensified these challenges. Urban areas are characterized by high population density, limited recreational infrastructure, and inadequate green coverage. National evidence indicates that approximately 13.6% of Bangladeshi children experience mental health disorders, reflecting a substantial and growing burden (Wadood et al., 2021). Despite this, research attention has predominantly focused on major metropolitan areas such as Dhaka, leaving secondary and coastal cities underexplored.

Khulna, located in the south-west coastal region of Bangladesh, represents a particularly significant yet understudied context. As a climate-vulnerable and rapidly urbanizing city, Khulna faces environmental stressors including salinity intrusion, rising temperatures, reduced green coverage, and increasing infrastructural pressure. Urban densification and limited child-friendly recreational facilities may restrict opportunities for safe outdoor play

and physical engagement. These structural and environmental constraints potentially have profound implications for children's mental resilience, physical development, and social well-being.

Despite the growing global consensus on the importance of playgrounds and green spaces as determinants of child health, empirical evidence from coastal urban Bangladesh remains limited. In particular, there is a notable gap in comparative research examining the mental and physical development of children with and without access to playgrounds within the same urban setting. Addressing this gap is essential not only for academic advancement but also for informing child-centered urban planning, public health interventions, and climate-resilient city development aligned with national priorities and the Sustainable Development Goals (SDGs).

Given the escalating mental health burden among children, ongoing urban transformation, and increasing recognition of environmental determinants of health, this study is both timely and necessary. By investigating the mental and physical development of children with and without access to playgrounds in urban coastal Khulna, the research seeks to generate context-specific evidence that supports inclusive urban design, equitable access to recreational spaces, and evidence-based policy interventions to safeguard child well-being in Bangladesh.

1.2 Research Objectives

General Objective:

To explore the availability and accessibility, of outdoor playgrounds influencing children's physical and mental health development, social interactions and well-being of children in urban areas of Khulna.

1.3 Research Questions

1. What significant differences exist in physical health/development outcomes such as physical fitness, motor skill development, and levels of physical activity between children with access to playgrounds and those without access?
2. How does playground accessibility affect children's mental health outcomes, including stress levels, emotional well-being, behavioral adjustment, and social interaction?
3. Which socio-environmental factors such as neighborhood characteristics, family support, safety perceptions, and urban infrastructure mediate or moderate the relationship between playground access and children's overall well-being?

1.4 Hypothesis Formulation

Based on the existing theoretical and empirical literature on child development, environmental determinants of health, and urban recreational infrastructure, this study proposes the following testable hypotheses to examine the relationship between playground accessibility and children's mental and physical development in urban south-west coastal Khulna, Bangladesh.

H₀₁ (Null Hypothesis): There is no significant difference in physical health outcomes (e.g., physical fitness, motor skills, and activity levels) between children with access to playgrounds and those without access.

H₁₁ (Alternative Hypothesis): Children with access to playgrounds demonstrate significantly better physical health outcomes (e.g., higher fitness levels, improved motor skills, and greater physical activity) compared to children without access.

H₀₂ (Null Hypothesis): Playground access has no significant effect on children's mental health outcomes, including stress levels, emotional well-being, and social interaction.

H₁₂ (Alternative Hypothesis): Children with access to playgrounds exhibit significantly better mental health outcomes, including lower stress levels, improved emotional well-being, and enhanced social interaction, compared to children without access.

H₀₃ (Null Hypothesis): Socio-environmental factors (e.g., neighborhood characteristics, family support, and urban infrastructure) do not significantly mediate or moderate the relationship between playground access and children's overall well-being.

H₁₃ (Alternative Hypothesis): Socio-environmental factors (e.g., neighborhood characteristics, family support, and urban infrastructure) significantly mediate or moderate the relationship between playground access and children's overall mental and physical well-being.

These hypotheses provide a structured analytical framework for quantitatively and qualitatively examining the association between playground accessibility and child development outcomes within the urban coastal context.

1.5 Significance of the Study

This study will contribute to a deeper understanding of the interrelationship between playground access and children's mental and physical health, particularly in coastal urban contexts, thus filling a gap in Bangladesh-focused research. The findings will provide valuable insights for urban planning policies, child-friendly community initiatives, and public health strategies, ensuring equitable access to playgrounds and green spaces for children. Educators, health practitioners, and community organizations can utilize these insights to design programs that promote physical activity, mental well-being, and social development among children. Additionally, the study will serve as a foundation for future research, offering baseline data for longitudinal studies on child development, playground use, and environmental determinants of health in urban Bangladesh.

1.6 Limitations of the Study

The accessibility and willingness of participants may influence the data collection process. Additionally, the findings of the study may not be generalizable to all urban areas in Bangladesh or to other countries. There is also a lack of data regarding the amount of time children spend playing in outdoor playgrounds and how often they visit these spaces each month. Furthermore, it may not be possible to fully capture the emotional responses of children during data collection or interviews, which could limit the depth of understanding regarding their experiences.

Chapter Two: Literature Review

2.1 The Role of Playgrounds in Children's Mental and Physical Development

Mental and physical health are fundamental components of overall well-being, particularly during childhood when cognitive, emotional, and physiological systems develop rapidly. The World Health Organization (WHO, 2022) defines mental health as a state of well-being in which individuals recognize their abilities, cope with normal life stresses, and contribute productively to their communities. Physical health refers to the biological, physiological, and functional capacities that enable individuals to actively engage in daily life and social interactions (Koipysheva et al., 2018).

Research shows a strong interrelationship between mental and physical health. Poor psychological well-being increases susceptibility to chronic physical illnesses, while physical inactivity contributes to stress, anxiety, and depression (Cadman et al., 1987; Whiney et al., 2019). During childhood, these interactions are particularly significant because both domains influence long-term health trajectories.

Physical activity plays a critical role in improving children's health outcomes. Regular participation in physical activity enhances cardiovascular fitness, muscle strength, motor coordination, and body composition. At the same time, it supports cognitive functioning, emotional regulation, and social competence (Rowland & Freedson, 1994; Ha et al., 2019; Ługowska et al., 2023). Studies indicate that children who engage in regular physical activity demonstrate better academic performance, improved attention span, and stronger emotional resilience.

Playgrounds and recreational environments provide essential spaces for structured and unstructured play. These environments encourage children to engage in physical activities such as running, climbing, and cooperative games, which contribute to both physical fitness and psychological development. Shieh and Chang (2014) and Mani et al. (2012) emphasize that playground activities stimulate creativity, problem-solving abilities, and social interaction among children.

Furthermore, access to green spaces and recreational facilities is associated with improved mental well-being. Children who have access to nearby playgrounds and parks often demonstrate lower levels of stress and anxiety and higher levels of social engagement and emotional stability (Rigolon, 2018; Alderton et al., 2022). These findings highlight the importance of integrating playground facilities into urban environments to support children's holistic development.

2.2 Effect of Playground and Socio-Environmental Factors on Mental and Physical Health and Development

Children's health and development are influenced not only by playground access but also by broader socio-environmental factors. The **Child-Friendly Community (CFC)** framework emphasizes that local governments and municipalities have a responsibility to create environments that protect children's rights to health, safety, play, and participation (UNICEF, 2018; Enns & Kombe, 2023).

Neighborhood characteristics such as safety, accessibility, infrastructure, and green space availability significantly influence children's opportunities for outdoor play. Research shows that children living near parks and playgrounds are more likely to engage in regular physical activity, spend less time on screens, and experience improved mental health outcomes (Bedimo-Rung et al., 2005; Vliet & Karsten, 2015; Wilson, 2022).

Rapid urbanization has significantly altered children's living environments worldwide. Increasing urban density, traffic congestion, environmental pollution, and shrinking green spaces limit opportunities for outdoor play and physical activity (Benzing & Schmidt, 2018). As a result, many children experience sedentary lifestyles, reduced physical activity levels, and increased risk of mental health challenges.

In coastal urban areas, additional environmental stressors further influence children's well-being. Climate-related factors such as salinity intrusion, heat exposure, and environmental hazards can restrict access to outdoor spaces and affect children's physical and psychological health.

In Bangladesh, secondary cities such as Khulna face rapid urban expansion, high population density, and limited recreational infrastructure. These conditions reduce children's access to safe playgrounds and recreational spaces (Wadood et al., 2021). The

COVID-19 pandemic further intensified sedentary behaviors and psychological stress among children due to school closures and limited outdoor activities (Pedrosa et al., 2020; Hossain et al., 2022). Therefore, socio-environmental factors play a significant role in shaping children's opportunities for healthy physical and mental development.

2.3 Research Gap

Although outdoor playgrounds, parks and green public spaces are widely recognised as important for children's physical, mental, social and emotional development, the issue has not been sufficiently explored in the urban context of Bangladesh, particularly in secondary and coastal cities such as Khulna. Global literature shows that safe and accessible green spaces support children's physical activity, motor coordination, social interaction, emotional regulation, stress reduction and overall well-being. UNICEF also emphasises that every child living in a city should have access within walking distance to a safe and welcoming public green space. However, in Bangladesh, the relationship between playground access and children's health outcomes remains under-researched, especially when both physical and mental health are considered together.

Bangladesh has a large child population, making this issue highly relevant for public health and urban planning. According to UNICEF Bangladesh, children aged 0–17 years constitute about 58.7 million, or 34% of the national population, while school-aged children aged 6–17 years account for about 39.2 million. This indicates that a significant portion of the population depends on child-friendly urban environments for healthy growth and development. At the same time, Bangladesh is undergoing rapid urbanisation. The share of the urban population reached about 41.23% in 2024, creating increasing pressure on land, housing, transport systems and public open spaces. As urban areas become more congested, children's opportunities for outdoor play are reduced, while sedentary lifestyles, screen exposure and restricted mobility become more common.

Existing studies in Bangladesh mostly focus on large metropolitan areas, especially Dhaka. Research on Dhaka has highlighted the scarcity of parks, playgrounds and accessible green spaces, as well as their implications for children's play, recreation and well-being. However, secondary cities such as Khulna, Rajshahi, Barishal, Rangpur and Sylhet have

received comparatively less empirical attention. This creates a geographical research gap. The developmental challenges faced by children in smaller urban centres may differ from those in Dhaka due to differences in population density, land-use pattern, service delivery, environmental vulnerability, social structure and availability of public facilities. Therefore, findings from Dhaka-based studies cannot be fully generalised to Khulna City.

Another major gap is that many studies examine children's physical health and mental health separately. Physical health studies often focus on physical activity, obesity, sedentary behaviour or screen time, while mental health studies focus on stress, anxiety, depression, emotional well-being or behavioural problems. However, children's health is multidimensional. Outdoor playgrounds may influence physical health by encouraging running, walking, sports, free play and motor activities. At the same time, they may influence mental health by reducing stress, improving mood, increasing peer interaction, strengthening confidence and creating a sense of freedom. In Bangladesh, where academic pressure, urban congestion, excessive screen use and limited outdoor mobility affect children's daily lives, it is important to examine physical and mental health together rather than separately.

National evidence also shows why this research is important. The WHO Physical Activity Profile for Bangladesh reports high levels of physical inactivity among adolescents aged 11–17 years, with inactivity estimated at 63% among boys and 69% among girls. A nationwide Bangladeshi study also found that insufficient physical activity is particularly high among adolescents in non-slum urban areas, reaching 77.7% among girls and 64.1% among boys. These findings suggest that urban children and adolescents are at risk of inadequate physical activity. However, existing national-level data do not adequately explain how access or lack of access to outdoor playgrounds shapes these outcomes at the neighbourhood or city level. Therefore, local comparative research is needed to understand whether children with playground access have better physical activity patterns and health indicators than those without such access.

There is also a comparative research gap. Few studies in Bangladesh directly compare children who have access to outdoor playgrounds with children who do not have access within the same urban setting. Without such comparison, it is difficult to identify whether

playground access is associated with differences in children's screen time, outdoor play frequency, peer interaction, emotional well-being, physical fitness, sleep pattern or sedentary behaviour. Comparative analysis is essential because it allows researchers to observe how environmental infrastructure contributes to unequal child development outcomes. This study addresses that gap by focusing on children with and without access to outdoor playgrounds in Khulna City.

Khulna provides a particularly important context for this study. According to the Population and Housing Census 2022, Khulna City Corporation had a population of 719,557 and 188,579 households, with a population density of 15,762 persons per square kilometre. About 14.97% of the population was under 10 years of age, while children aged 0–14 years represented about 23.23% of the city population. These figures indicate that a considerable number of children live within a dense urban environment where access to safe outdoor spaces is important. However, studies on Khulna's urban green spaces show serious shortages and unequal distribution. Research on the spatial distribution of parks in Khulna found that the city has only eight parks, covering only about 0.15% of the total Khulna City Corporation area. Only 7 out of 31 wards, or 23% of wards, have parks, meaning that 24 wards, or 77% of wards, remain deprived of park facilities. The same study found that only about 27% of the city population lives in wards with parks, while 73% of residents live in wards without parks. This unequal distribution makes Khulna a highly relevant study area for examining how playground access may influence child health.

Furthermore, Khulna is located in the south-western coastal region of Bangladesh and is exposed to climate-related risks such as heat stress, flooding, waterlogging, cyclones and salinity intrusion. Bangladesh is recognised as one of the most climate-vulnerable countries in the world, and UNICEF's Children's Climate Risk Index ranked Bangladesh among the “extremely high-risk” countries for children affected by climate and environmental shocks. Climate-related disruptions also affect children's education, mobility, recreation and daily life. UNICEF reported that areas including Khulna experienced climate-induced school closures in 2024. In such a climate-vulnerable urban context, outdoor playgrounds are not only recreational facilities; they can also serve as climate-sensitive public health infrastructure if they are designed with shade, drainage, greenery, safety and accessibility.

However, very few studies have examined the link between playground access and child health in climate-vulnerable coastal cities like Khulna.

Another underexplored issue is equity. Access to playgrounds may vary by ward, income group, housing condition, school type, gender, parental perception of safety and distance from home. Girls may face additional social and safety restrictions in using outdoor spaces, while children from low-income families may have fewer private recreational alternatives. Children living in dense neighbourhoods, slum areas or rented housing may depend more heavily on public playgrounds than children from higher-income families. Yet, existing research rarely examines playground access as a matter of child equity and environmental justice in Khulna City. This creates a policy-relevant gap because unequal access to outdoor play spaces may reinforce inequalities in health, social development and well-being.

Therefore, the present study is justified because it addresses several gaps in the existing literature. First, it shifts attention from Dhaka-centred research to Khulna, a secondary coastal city of Bangladesh. Second, it examines both physical and mental health outcomes rather than treating them separately. Third, it compares children with playground access and children without playground access within the same urban setting. Fourth, it considers the climate-vulnerable and spatially unequal context of Khulna City. Finally, the study can generate evidence useful for child-friendly urban planning, public health interventions, school-based recreation programmes and climate-resilient open space development in Khulna. By filling these gaps, the research will contribute to a more context-specific understanding of how access to outdoor playgrounds influences children's physical and mental health in urban Bangladesh.

Chapter Three: Methodology

3.1 Theoretical Background

This study is guided by several theoretical perspectives related to child development and environmental health.

Ecological Systems Theory

Bronfenbrenner's Ecological Systems Theory suggests that child development is influenced by multiple environmental systems, including family, community, and broader social structures. Playgrounds and neighborhood environments represent important components of the **microsystem** and **mesosystem**, directly shaping children's physical activity and social interactions.

Environmental Health Theory

Environmental health perspectives emphasize that the built environment plays a crucial role in shaping health outcomes. Access to safe recreational spaces encourages physical activity and reduces exposure to sedentary behaviors, thereby improving both mental and physical health outcomes.

Child-Friendly City Framework

The Child-Friendly City framework promoted by UNICEF highlights the responsibility of urban planning systems to ensure safe, inclusive, and supportive environments for children. Accessible playgrounds and recreational spaces are essential elements of child-friendly urban development.

Together, these theoretical perspectives provide a comprehensive foundation for understanding how playground access and socio-environmental conditions influence children's mental and physical development.

3.2 Conceptual Framework

This study conceptualizes playground access as a key environmental factor influencing children's mental and physical development. Access to playground facilities encourages

physical activity, social interaction, and outdoor engagement, which in turn contribute to improved physical fitness, motor development, emotional well-being, and social competence.

The framework also recognizes the role of socio-environmental factors such as neighborhood safety, family support, accessibility of recreational infrastructure, and urban environmental conditions. These factors may mediate or moderate the relationship between playground access and child development outcomes.

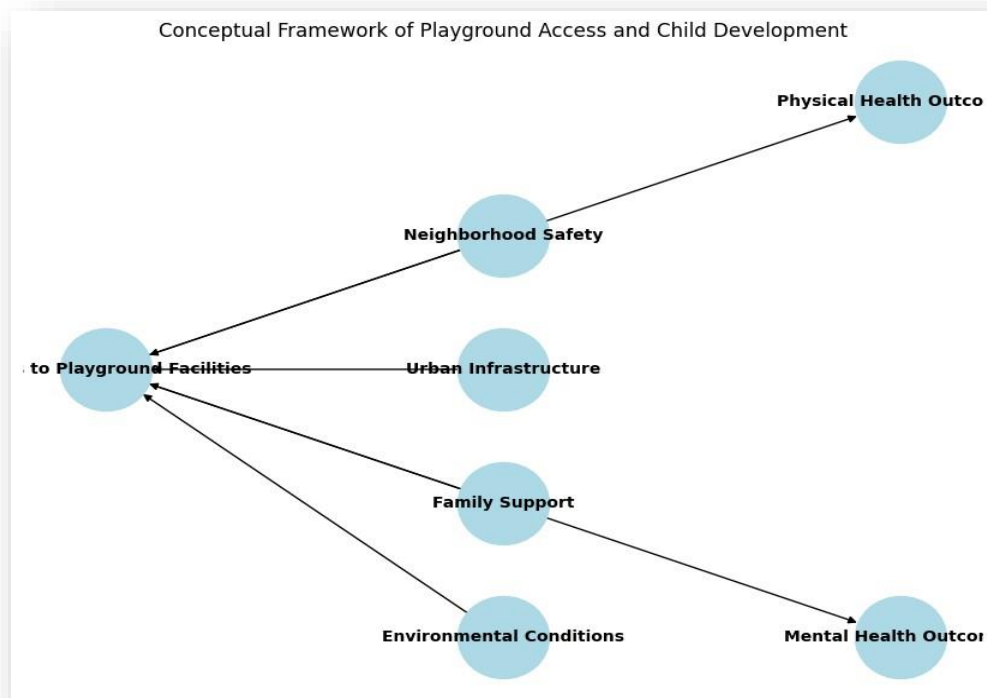


Figure 4: Diagram of Conceptual Framework



Figure 2: Diagram of Enhanced Children Development

Here is the diagram of the conceptual framework based on your study, illustrating the relationship between playground access, child development outcomes, and the socio-environmental factors that mediate or moderate this relationship. The framework shows the independent variable (access to playground facilities), dependent variables (physical and mental health outcomes), and mediating/moderating variables such as neighborhood safety, urban infrastructure, family support, and environmental conditions.

The conceptual framework assumes that improved playground access, combined with supportive socio-environmental conditions, enhances children's overall mental and physical development.

3.3 Data and Variables:

This study adopted a mixed-methods research design, combining quantitative and qualitative approaches to understand children's mental and physical development in relation to playground accessibility. Quantitative data were collected through structured surveys to measure physical activity, mental well-being, and socio-demographic characteristics. Qualitative data were gathered through interviews, focus group discussions (FGDs), and key informant interviews (KIIs) to explore children's experiences and parental perceptions regarding playground use.

The study was conducted in selected urban neighborhoods of southwestern coastal Khulna, Bangladesh, including areas with and without community playgrounds. Khulna's rapidly urbanizing environment provided an appropriate context for examining the relationship between playground access and children's health outcomes.

The target population included children aged 4–10 years, both boys and girls, living in the selected urban areas. Parents or guardians of children aged 24 months were also included to provide additional insights into early childhood development and environmental influences.

Playground access was measured as a binary variable:

0 = No playground within walking distance

1 = At least one playground within walking distance

Walking distance was defined as being within 400 meters of the child's residence.

A stratified random sampling technique was used to ensure representation of children from neighborhoods with and without playground access. The population was divided into two strata based on the presence of playgrounds within 400 meters, and respondents were selected randomly from each group.

The study included approximately 200 children. The sample size was determined based on population distribution, feasibility, and reference to similar studies, allowing comparison between children with and without playground access.

Primary data were collected through structured questionnaires, direct observations, and FGDs. The questionnaires gathered information on physical activity, mental health, and socio-demographic factors. Observations assessed playground use and children's physical activity, while FGDs explored perceptions of mental and social well-being.

Secondary data were collected from literature reviews, municipal records, government statistics, and health reports to provide contextual information on playground distribution and child health indicators in Khulna.

Quantitative data were analyzed using statistical software such as SPSS, STATA, or Excel, depending on access and availability. Descriptive statistics, comparative analysis, and correlation analysis were used to examine the relationships between playground access and children's health outcomes.

Qualitative data were analyzed using thematic analysis to identify patterns related to children's experiences, emotional well-being, and social interaction. The qualitative findings complemented the quantitative results and provided a comprehensive understanding of playground accessibility and child development.

Type of Variable	Name of Variable	Unit of Measurement	Expected Sign (+, -)	References
Section A: Socio-Demographic Information				
Independent	Child Age	Years	+	WHO Child Growth Standards (2006)
	Sex	Male/Female	N/A	WHO Child Growth Standards (2006)
	Currently enrolled in school	Yes/No	+	UNESCO, 2020
	Class level	Nursery–Class 6	+	Local Education Statistics
	Parent/guardian education level	No formal/Primary/Secondary/Higher	+	UNICEF, 2019
	Number of children in household	Count	-	World Bank, 2021
	Household monthly income	BDT	+	Bangladesh Bureau of Statistics, 2021
	Type of residence	Slum/Semi-pucca/Pucca	+	UN-Habitat, 2016

Type of Variable	Name of Variable	Unit of Measurement	Expected Sign (+, -)	References
	Household members	Count	N/A	Demographic Surveys
Section B: Access to Playground (Exposure Variable)				
Independent	Playground within 400m	Yes/No	+	WHO Urban Health Studies, 2016
	Type of playground	Public/School/Private/Open	+	WHO Urban Health Studies, 2016
	Frequency of playground use	Days/week	+	WHO Urban Health Studies, 2016
	Average duration per visit	Minutes	+	WHO Urban Health Studies, 2016
Section C: Physical Activity & Development				
Dependent	Physical activity level	Days/week	+	WHO GPAQ, 2020
	Type of activities	Categorical	+	CDC Child Growth Studies, 2018
	Height	cm	+	WHO Child Growth Standards, 2006

Type of Variable	Name of Variable	Unit of Measurement	Expected Sign (+, -)	References
	Weight	kg	+	WHO Child Growth Standards, 2006
	BMI	kg/m ²	±	WHO Child Growth Standards, 2006
	BMI-for-age Z-score	SD	±	WHO Child Growth Standards, 2006
	Reported growth concerns	Yes/No	-	CDC Child Growth Studies, 2018
	Physical fitness (peer comparison)	Below/Average/Above	+	CDC Child Fitness Surveys
Section D: Mental Health & Psychosocial Well-Being				
Dependent	WHO-5 Well-being Index (Q23–Q27)	0–5 Likert	+	WHO-5, 1998
	Emotional well-being (Q28–Q30)	0–2 Likert	+	Strengths & Difficulties Questionnaire (SDQ)

Type of Variable	Name of Variable	Unit of Measurement	Expected Sign (+, -)	References
	Behavioral & conduct (Q31–Q33)	0–2 Likert	-	SDQ, 2010
	Peer relationship & social skills (Q34–Q36)	0–2 Likert	+	SDQ, 2010
Section E: Cognitive & Emotional Regulation				
Dependent	Concentration on age-appropriate tasks (Q37)	1–5 Likert	+	Child Behavior Checklist (CBCL)
	Emotion management during conflict (Q38)	1–5 Likert	+	CBCL, 2001
	Curiosity & creativity during play (Q39)	1–5 Likert	+	CBCL, 2001
Section F: Screen Time & Sedentary Behavior				
Independent	Average daily screen time	Hours/day	-	WHO Guidelines on Physical Activity, 2020

Type of Variable	Name of Variable	Unit of Measurement	Expected Sign (+, -)	References
	Screen time increase due to lack of playground	Yes/No	-	WHO Guidelines on Physical Activity, 2020
Section G: Parental Perception & Environmental Safety				
Independent	Neighborhood safety	1–5 Likert	+	Urban Health Studies, 2016
	Playground supports mental well-being	Yes/No	+	WHO Urban Health Studies, 2016
	Barriers to playground use	Multiple response	-	WHO Urban Health Studies, 2016
Section H: Social Support				
Dependent	Perceived social support (Q45–Q56)	1–7 Likert	+	MSPSS (Zimet et al., 1988)
Section I: Comparative Outcome Assessment				
Dependent	Overall physical health	Poor–Very Good	+	Self-reported Health Surveys, 2019
	Overall mental well-being	Poor–Very Good	+	WHO Well-being Index, 1998

Table-01: List of variables (dependent and independent)

3.4 Sampling Technique and Data Collection Procedure

To ensure representative and unbiased data collection, cluster basis purposive sampling method will be employed for this study. The sampling will aim to capture variations in children's mental and physical development based on their access to playgrounds. The process will be conducted as follows:

-Study Population and Sampling Frame

The study population will comprise children aged 4–10 years residing in selected urban and peri-urban areas of Khulna, Bangladesh. A preliminary mapping exercise will identify households within the target areas and will note the proximity of playgrounds relative to their homes. Playgrounds will be defined as any safe public or private space suitable for children's play, including school-based playgrounds, public parks, and informal open spaces.



-Stratification Based on Playground Access

To examine the effect of playground access, children will be stratified into two groups:

- Stratum 1: Children living within 400 meters (approximately a 5–10 minute walking distance) of a playground.
- Stratum 2: Children living beyond 400 meters from the nearest playground.

This stratification will ensure that each group is proportionally represented, allowing for meaningful comparison between children with and without playground access.

-Sample Size Determination

The total sample size will be set at 200 children, based on population size, feasibility considerations, and references from similar studies in urban settings of Bangladesh. To achieve balanced representation across the two strata, the sample will be equally divided:

- 172 (86%) children with playground access (within 400 meters)
- 28 (14%) children without playground access (beyond 400 meters)

This 86:14 allocation will ensure that the study will be able to detect differences in mental, social, and physical outcomes between the two groups.

-Cluster basis Purposive Selection (Purposive Sampling)

Within the study area, households with eligible children will be purposively selected. This method will minimize selection bias and will ensure that each eligible child will have an equal chance of being included in the study.

Inclusion and Exclusion Criteria

- Inclusion criteria: Children aged 4–10 years whose parents or guardians will provide informed consent.
- Exclusion criteria: Children with severe physical or cognitive disabilities that will prevent participation in physical activity or completion of the questionnaire survey.

-Final Sample Allocation

After stratification and random selection, the final sample were comprise 200 children, divided as follows:

Stratum	Playground Access	Number of Children	Percentage
1	Within 400 meters with access of playground	126	63%
2	Within 400 meters without access of playground	74	37%

Table-02: Sample size and percentage (%)

This stratified random sampling approach will ensure that the study will be able to compare children's mental, physical, and social development outcomes while controlling for potential confounding factors related to playground accessibility.

-Data Collection technique with plan

A total of 200 interviews were conducted to explore the results more authentic.

Techniques of Data Collection	Method	Types of Respondent Target group	Target (quantity)
Quantitative Data Collection	Structured Questionnaire	Children 4-10 Years	200 (with playground 126, without 74)

Table-03: Data Collection Technique with plan

3.5 Empirical Analysis

The study will employ a structured questionnaire to collect data on children's mental and physical development, access to playgrounds, socio-demographic characteristics, and other relevant variables. The questionnaire will include multiple sections:

- Section A: Socio-demographic information (child and household characteristics)
- Section B: Access to playground (proximity, type, frequency, and duration of use)
- Section C: Physical activity and physical development (height, weight, BMI, activity levels)
- Section D: Mental health and psychosocial well-being (WHO-5 Well-being Index, emotional, behavioral, and social aspects)
- Section E: Cognitive and emotional regulation
- Section F: Screen time and sedentary behavior

- Section G: Parental perception and environmental safety
- Section H: Multidimensional scale of perceived social support
- Section I: Comparative outcome assessment of overall physical and mental health

Anthropometric measurements such as height and weight will be measured using standard procedures. BMI-for-age Z-scores will be calculated according to WHO child growth standards (2006). Likert scales and categorical responses will be used for psychosocial and behavioral assessments.

All measurement tools will be adapted from validated sources, including WHO guidelines, CDC growth studies, and the Multidimensional Scale of Perceived Social Support (MSPSS).

3.6 Analytical Tools

Data were analyzed using quantitative statistical methods. Descriptive statistics (mean, standard deviation, frequency, and percentage) were used to summarize children's characteristics, playground access, physical activity, and mental health outcomes.

To examine the relationship between access to playgrounds and children's developmental outcomes while controlling for socio-demographic and household variables, regression analysis was employed.

All analyses were performed using Excel and statistical significance was determined at the 5% level ($p < 0.05$).

Chapter Four: Result and Discussion

4.1 : Socio-Demographic Information

4.1.1 Study Area

Data were collected from two homogeneous residential areas to ensure data quality and reduce heterogeneity among respondents. A total of **200 observations** were obtained, with **100 (50%)** collected from Nirala Residential Area and **100 (50%)** from Sonadanga Residential Area. The balanced proportion of respondents across the two study locations indicates adequate representation and contributes to the reliability and internal consistency of the dataset. The selection of homogeneous residential areas was intended to minimize the influence of contextual differences and improve the accuracy of statistical comparisons.

Figure 4: Area of data Collection

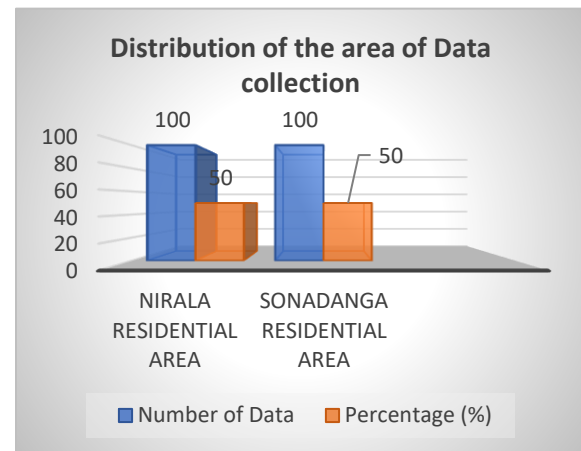
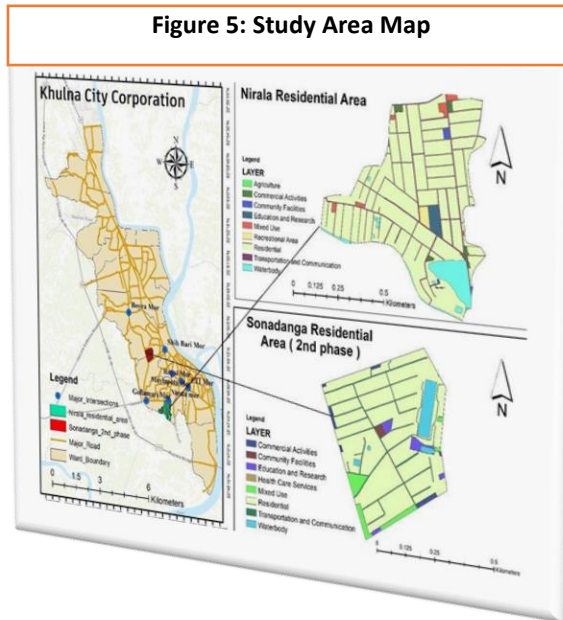


Figure 5: Study Area Map



4.1.2 Religious Affiliation of the Children

Muslims 84%, Hindus 11% and Christians 5%

Table-04: Religion of the respondent

Religion	Percentage (%)	Expected Number (n=200)
Islam	84	168
Hinduism	11	22
Christianity	5	10
Total	100	200

The distribution of religious affiliation among the children shows that the majority of respondents were Muslims. Out of the total respondents, 84% were affiliated with Islam, representing approximately 168 children. Hindu children accounted for 11% of the respondents, representing about 22 children, while Christian children constituted 5%, representing about 10 children.

The findings indicate that Muslim children formed the largest religious group in the study population, followed by Hindu and Christian children. This suggests that the sample was predominantly Muslim, with comparatively smaller representation from Hindu and Christian communities. Therefore, the religious composition of the respondents reflects an uneven distribution, where Islam was the most common religious affiliation among the children included in the study.

4.1.3 Age and Sex Distribution of the Children and Respondent

Table-05: Age Distribution of the children

Variable	Mean Age (Years)	Minimum Age (Years)	Maximum Age (Years)
Age of Children	6.8	4	10

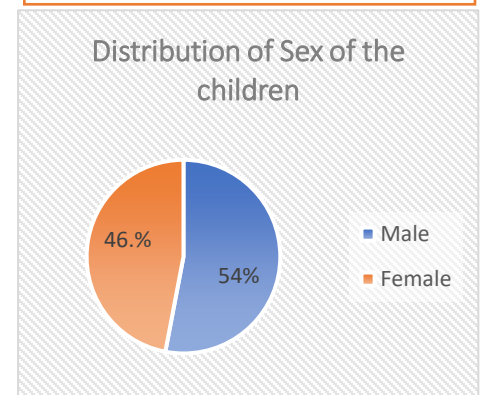
Table presents the age distribution of the children included in the study. The mean age of the children was 6.8 years, indicating that the majority of participants were in early childhood. The youngest child was 4 years old, while the oldest was 10 years old, resulting in an age range of 6 years. These findings suggest that the study population consisted primarily of young school-aged children.



4.1.4 Gender Distribution of Respondents

A total of 200 respondents participated in the study. Among them, 108 respondents (54%) were male and 92 respondents (46%) were female. The distribution indicates a relatively balanced representation of both genders, although male respondents constituted a slightly higher proportion of the sample. This balanced gender composition enhances the representativeness of the study and reduces the likelihood of gender-related bias in the findings. Therefore, the collected data provide a suitable basis for analyzing the study variables across both male and female participants.

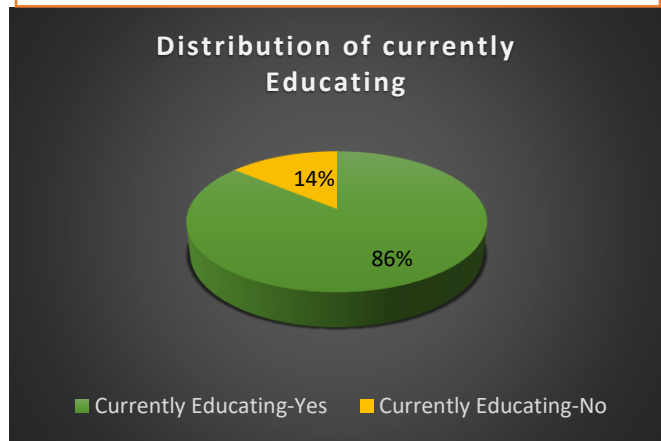
Figure 6: Distribution of Gender of the children



4.1.5 Educational Status of the Children

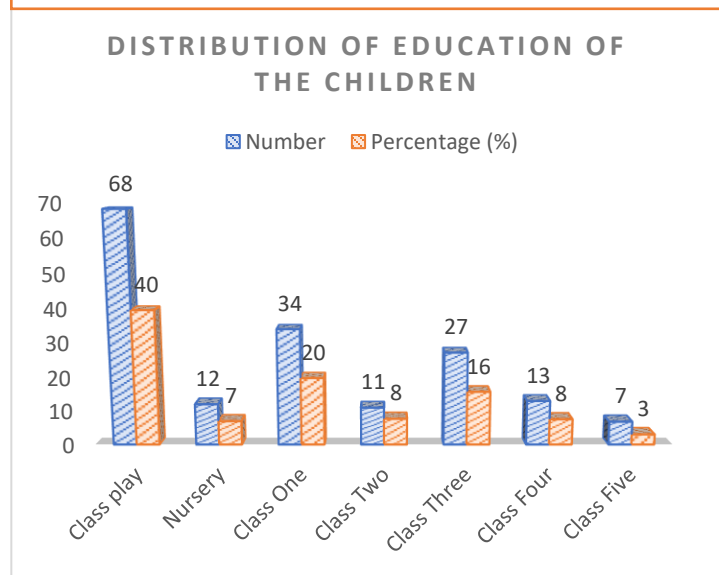
The educational status of the children is presented in the chart. Out of 200 children, the majority (86%, n=172) were currently attending formal education, while 14% (n=28) were not enrolled in any educational institution at the time of the survey. This finding indicates a high level of school participation among the study children.

Figure 7: Distribution of currently educating of the children



A total of 172 students were enrolled across seven classes. The largest group was Class Play with 68 students (40%), followed by Class One with 34 students (20%) and Class

Figure 8: Distribution of education by Class



Three with 27 students (16%). Nursery, Class Two, and Class Four each had 13 students (8%), while Class Five had the fewest students, with 7 students (3%) and with 12 students (7%) were in class nursery. Overall, most students were concentrated in the lower classes, particularly Class Play.

Table 6: Age at Initiation of Formal Education Among Children

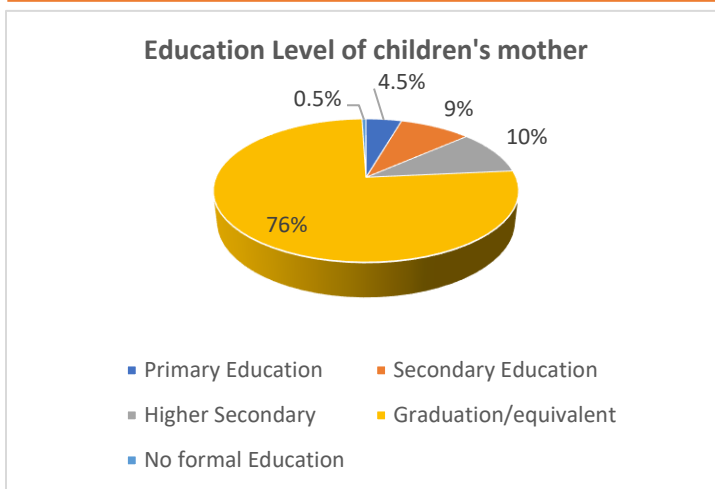
Variable	Mean (Years)	Minimum (Years)	Maximum (Years)
Age at Starting Formal Education	5.5	4.0	6.0

The age at initiation of formal education is shown in Table 1.5. The mean age at which children started formal education was 5.5 years. The minimum age of school enrollment was 4.0 years, whereas the maximum age was 6.0 years. These findings suggest that most children commenced formal education within the recommended school-entry age range.

4.1.6 Educational Status of the Mothers of the Children

A clear majority, 76% (152), reported having a graduation or equivalent qualification, indicating that most respondents are well-educated and possess at least a university-level degree. This is followed by Higher Secondary education 20 (10%) and Secondary education 18 (9%), together accounting for 19% of

Figure 9: Distribution of educational Level of children's mother

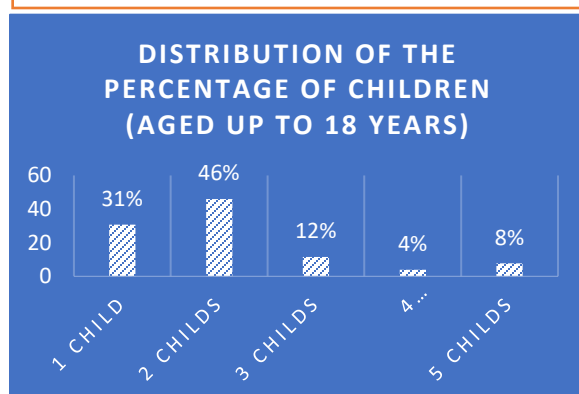


the sample. Only a small proportion of respondents reported Primary education (4.5%), while an extremely marginal 0.5% had no formal education.

4.1.7 Number of Children per Household

Based on the data from 200 households, the distribution of children (aged up to 18 years)

Figure 10: Distribution of the percentage of children (aged up to 18 years)



shows that the largest proportion of households have 2 children, accounting for 46% of households. This is followed by 1 child, which represents 31% of households. Together, these two categories (One and Two child) make up the majority 77% of the sample, indicating that smaller family sizes are most common.

Households with 3 children account for 12%, while those with 5 children and 4 children represent 8% and 4%, respectively. These findings suggest that relatively larger households (3 or more children) are less frequent compared to smaller households.

Overall, the distribution demonstrates a clear tendency toward smaller families, with nearly three-quarters of households having one or two children.

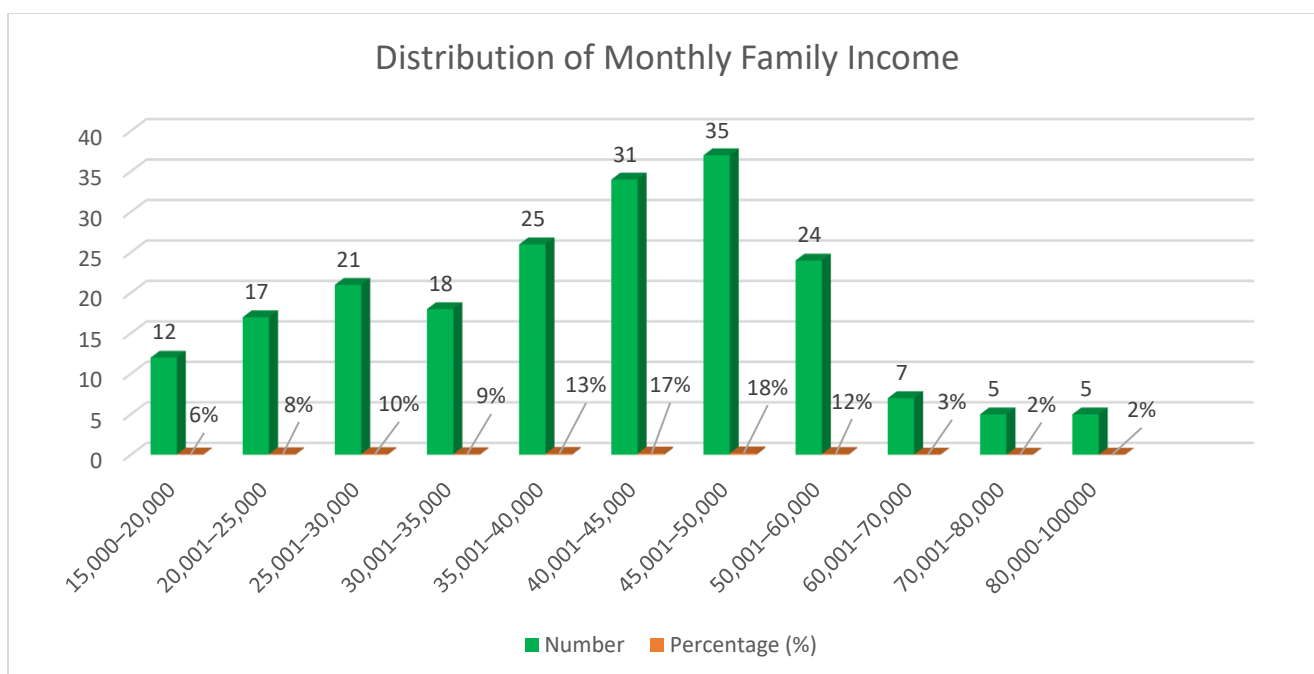
4.1.8 Household Family Composition

The average household size among the surveyed families was 4.54 members. Household size ranged from a minimum of 3 members to a maximum of 7 members, indicating moderate variation in family composition across the study population. The findings suggest that most households consisted of approximately four to five members, which is consistent with the typical family structure observed in many rural and peri-urban communities of Bangladesh.

The relatively narrow range of household size indicates a fairly homogeneous household composition among respondents, with no extremely small or exceptionally large families reported in the sample.

4.1.9 Household Income Status (Per month)

Figure 11: Distribution of Monthly Family Income



A total of 200 households participated in the survey, representing a diverse but moderately clustered socioeconomic spectrum. Monthly household income ranged widely from BDT 15,000 to above BDT 100,000, reflecting noticeable variation in economic capacity across the study population. The estimated mean monthly income was BDT 40,049, suggesting an overall moderate level of economic well-being among the respondents. The median income fell within the BDT 40,001–45,000 bracket, indicating a near-even division of households above and below this threshold. The modal income category was BDT 45,001–50,000, highlighting this range as the most common economic standing within the sample. In terms of distribution, the highest proportion of households (17.96%, $n = 36$) reported incomes between BDT 45,001 and BDT 50,000, closely followed by 16.50% ($n = 31$) within the BDT 40,001–45,000 range. At the upper end of the spectrum, only a small fraction (2.43%, $n = 5$) reported monthly incomes exceeding BDT 80,000, underscoring the limited representation of high-income households in the study area.

Overall, income distribution revealed a clear concentration within the middle-income band. Approximately one-third of households (33.01%) earned less than BDT 35,000 per month, while a majority (53.58%) fell within the BDT 35,001–60,000 range. In contrast, only

8.26% of households reported incomes above BDT 60,000, indicating a relatively narrow upper-income segment.

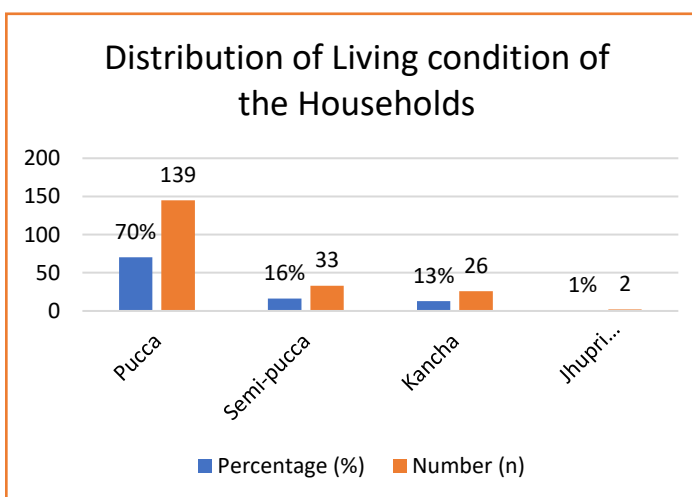
Taken together, the closeness of the mean, median, and modal income categories reflects a moderately balanced distribution, gently centered around the lower-middle to middle-income brackets. This pattern suggests that the study population is neither highly polarized nor extremely affluent, but instead economically clustered around a modest and stable income range.

4.1.10 Living condition of the Households

A total of 200 households were included in the study. The findings reveal a clear dominance of durable housing conditions, with the majority of households (70%, n = 139) residing in pucca houses. This was followed by 16% (n = 33) living in semi-pucca structures. In contrast, 13% (n = 26) of households still occupied kancha dwellings, while a marginal 1% (n = 2) lived in jhupri-type housing.

These results underscore the overall predominance of permanent housing structures within the urban context of Bangladesh, reflecting ongoing improvements in housing quality and urban infrastructure development. However, the continued presence of households in kancha and jhupri conditions points to

Figure 12: Distribution of Living condition of the Households



persistent intra-urban inequalities, highlighting that the benefits of urbanization remain unevenly distributed across socioeconomic groups.

4.2: Access to Playground

4.2.1 Status of Access to playground; within 400 meters from your home

The findings show that the majority of children had access to a playground within 400 meters of their residence. Out of 200 respondents, 126 children, representing 63%, reported having access to a playground within this distance. In contrast, 74 children, representing 37%, reported that they did not have access to a playground within 400 meters.

This result indicates that although more than half of the children had nearby playground access, a considerable proportion still lacked such facilities. Access to playgrounds within a short distance may encourage children to participate in outdoor play and physical activity more regularly. However, the 37% without access may face limited opportunities for active play, which could negatively influence their physical activity level and overall health.

Figure 13: Distribution of children access to playground within 400 miters

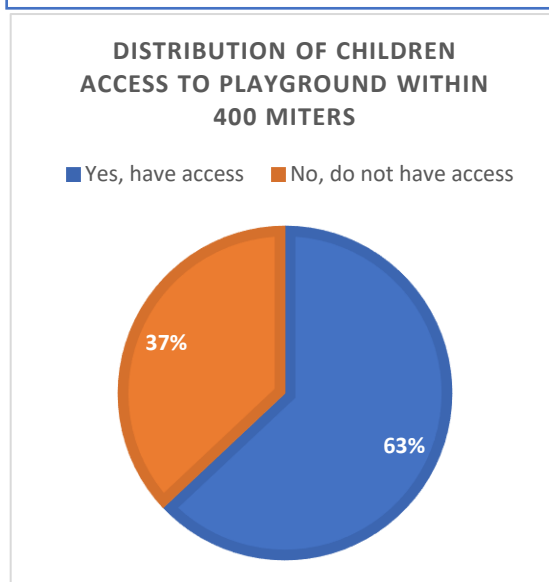


Table-07: Access to Playground within 400 meters

Access to Playground within 400 meters	Sonadanga R/A		Nirala R/A		Total Result	
	Number	Percentage (%)	Number	Percentage (%)	Total Number	Total Percentage (%)
With Access	48	51.1%	78	73.6%	126	63%

Without Access	46	48.9%	28	26.4%	74	37%
Total	94	100%	106	100%	200	100%

The findings indicate that access to playgrounds within a 400-meter radius was higher in Nirala R/A compared to Sonadanga R/A. In Nirala R/A, 78 out of 106 children (73.6%) had access to a nearby playground, whereas 28 children (26.4%) did not have such access. In contrast, Sonadanga R/A demonstrated comparatively lower accessibility, where 48 out of 94 children (51.1%) had access to playground facilities, while 46 children (48.9%) did not. This suggests that nearly half of the children in Sonadanga R/A were deprived of nearby recreational spaces.

The relatively higher level of access in Nirala R/A may be attributed to the presence of a designated children's park within the locality, which facilitates regular outdoor play and physical activity. Conversely, the absence of adequately accessible open spaces in Sonadanga R/A likely restricts children's opportunities for consistent outdoor engagement. Overall, the results suggest that the availability of nearby play spaces is substantially better in Nirala R/A than in Sonadanga R/A, which may have important implications for children's physical activity levels and overall well-being.

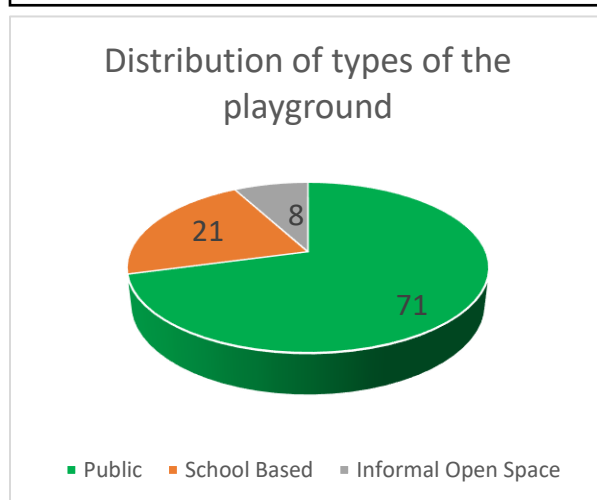
At the national level, a similar pattern is observed, with evidence indicating that only about 16% of urban residents in Bangladesh have access to playground facilities, while approximately 84% remain without such access, reflecting substantial inequalities in urban recreational infrastructure.

In contrast, the World Health Organization (WHO) recommends universal access (100%) to safe, accessible play spaces within a walking distance of approximately 300–500 meters for all children. Taken together, both the study findings and national estimates fall significantly short of this global benchmark, underscoring the urgent need for more equitable planning and distribution of playground facilities.

4.2.2 Type of the playground access by the children

The survey shows that the majority of playground access comes from **public playgrounds (71%)**, indicating they are the dominant form of play space. **School-based playgrounds**

Figure 14: Distribution of types of the playground

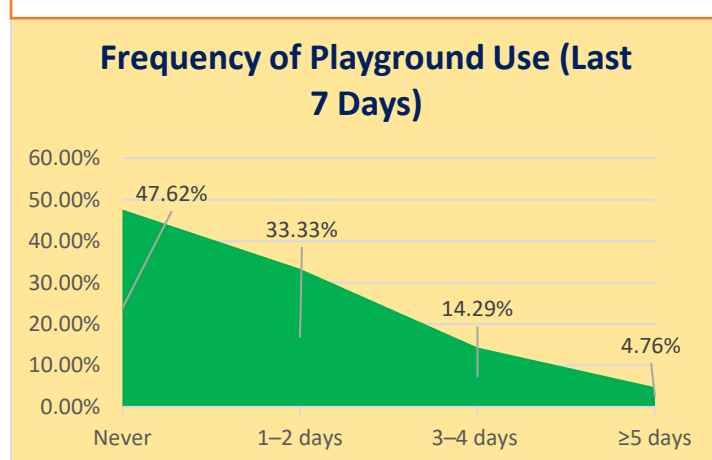


(21%) serve a secondary role, mainly for enrolled children during school hours. A small proportion of children (8%) rely on **informal open spaces**, suggesting limited structured recreational infrastructure in some areas.

4.2.3 Frequency of playground use in the last 7 days

Among of the 126 children who have access the playground, the data shows that nearly half of the children (47.6%, n=60) did not visit a playground at all in the last 7 days, indicating very low regular access or usage. About one-third (33.3%) used playgrounds only 1–2 days per week, suggesting occasional engagement.

Figure 15: Distribution of playground using last 7 days



Very few children (14.3%) used playgrounds 3–4 days, and only a small minority (4.8%) accessed playgrounds frequently (5 or more days). This pattern highlights generally low consistent playground utilization among children in the surveyed area.

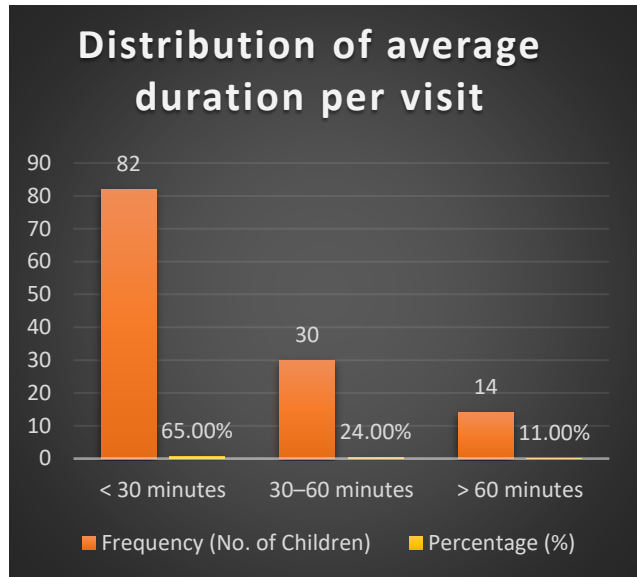
4.2.4 Average duration per visit with access of playground

The findings show that among the 126 children who had access to a playground, the majority spent less than 30 minutes per visit. Specifically, 82 children, representing 65.0%, reported spending less than 30 minutes during each playground visit. This indicates that although playground access was available, the duration of use was relatively short for most children.

About 30 children, representing 24.0%, spent 30–60 minutes per visit, while only 14 children, representing 11.0%, spent

more than 60 minutes. This suggests that a smaller proportion of children engaged in longer playground visits. Overall, the data indicates that most children with playground access used the playground for a limited duration, which may reduce the potential benefits of outdoor play and physical activity.

Figure 16: Distribution of average duration per visit



4.2.5 Type of Activities Performed During Playground Visit who having the access of playground

The findings show that running and free play were the most common activities performed during playground visits among children who had access to playgrounds. Out of 126 children, 82 children, representing 65.0%, were engaged in running and free play. This indicates that playground use was mainly dominated by unstructured and spontaneous physical activities.

Football and cricket were reported by 30 children, representing 24.0%, indicating moderate participation in organized or group-based sports. In contrast, cycling was the least practiced activity, reported by only 14 children, representing 11.0%.

Overall, the findings suggest that children mostly used playgrounds as open spaces for informal movement and free play rather than for structured sports or equipment-based

activities. The low participation in cycling may be related to limited cycling facilities, lack of equipment, or safety concerns within playground areas.

Figure 17: Picture of Children's Activity

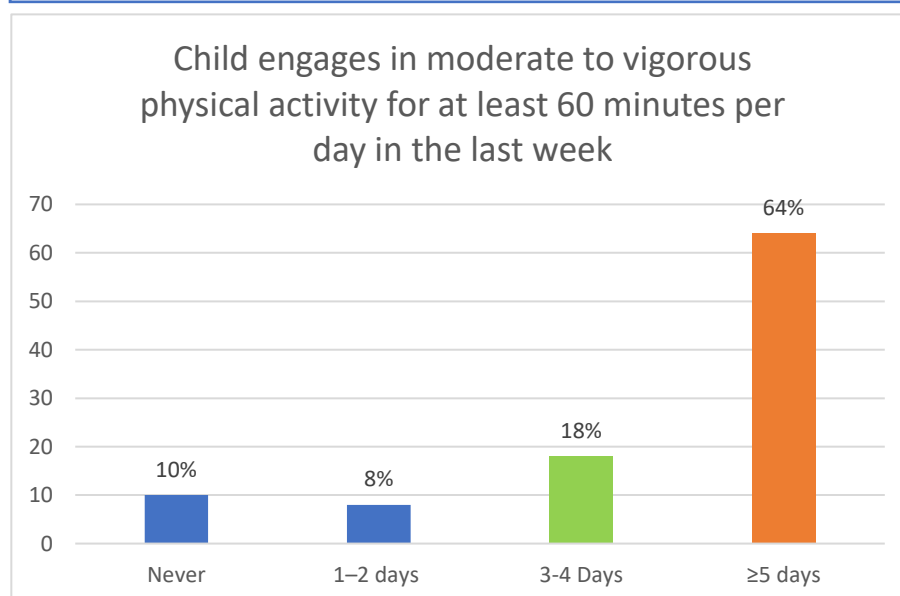


4.3: Physical Activity & Physical Development

4.3.1 Child's engagement in moderate-to-vigorous physical activity

Child engages in moderate to vigorous physical activity for at least 60 minutes per day in

Figure 18: Child engages in moderate to vigorous physical activity for at least 60 minutes per day in the last week



the last week and types of activity.

The findings show that the majority of children engaged in moderate to vigorous physical activity for at least 60 minutes per day on more than 5 days per week.

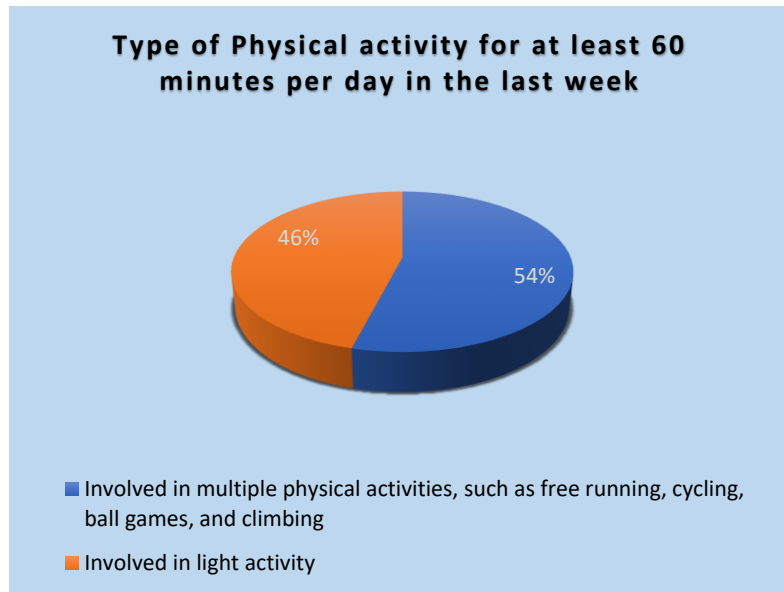
Specifically, 64% of the respondents reported this level of physical activity for more than 5 days, indicating a relatively high level of regular physical activity among the children. In comparison, 18% of children engaged in such activity for 3–4 days per week, while 8% reported participation for only 1–2 days per week. However, 10% of the respondents reported that they never engaged in moderate to vigorous physical activity for at least 60 minutes per day.

Regarding the types of activities performed, 54% of the children were involved in multiple physical activities, such as free running, cycling, ball games, and climbing. These activities indicate active play and

involvement in physically demanding movements. On the other hand, 46% of children performed light activities, which may not provide the same level of physical benefit as moderate to vigorous activities.

Overall, the results suggest that a considerable proportion of children maintain an active lifestyle through regular physical activity. However, the presence of children who engage in physical activity for fewer days, or not at all, indicates the need for greater encouragement and support to promote daily physical activity. Increasing opportunities for active play, sports, and outdoor movement may help improve children's physical fitness, growth, and overall health.

Figure 19: Type of Physical activity for at least 60 minutes per day in the last week



4.3.2 BMI-for-Age Z-Score among Children

Table-08: BMI-for-Age Z-Score distribution of the children

BMI-for-Age Z-Score Category	Survey result Total (N=200)	National Data PubMed
Severe Thinness (< -3 SD)	13 (6.5%)	17.6%
Thinness (-3 SD to < -2 SD)	31 (15.5%)	
Normal (-2 SD to +1 SD)	115 (57.5%)	69.4%
Overweight (> +1 SD to +2 SD)	28 (14.0%)	9.5%
Obesity (> +2 SD)	13 (6.5%)	3.5%
Total	200 (100%)	100%

The nutritional status of the children was assessed using BMI-for-age Z-score categories. Among the 200 children, 6.5% (n = 13) were severely thin and 15.5% (n = 31) were thin, giving a combined thinness prevalence of 22.0%, which is higher than the national figure (17.6%). A total of 57.5% (n = 115) had normal BMI-for-age, while 14.0% (n = 28) were overweight and 6.5% (n = 13) were obese, resulting in 20.5% with excess body weight.

Compared to national data, the study shows a lower proportion of normal BMI (57.5% vs. 69.4%) and higher levels of both undernutrition and overnutrition. This indicates a double burden of malnutrition, characterized by the coexistence of thinness and overweight/obesity within the same population.

4.3.3 Association between Playground Access and BMI-for-Age Z-Score among Children (N = 200)

BMI-for-age Z-score category was analyzed according to children's access to playground. Among the 200 children, 126 (63.0%) had access to playground and 74 (37.0%) had no access to playground.

Table-09: BMI-for-Age Z-Score distribution of the children among with access and without access to playground

BMI-for-Age Z-Score Category	Access to Playground (n=126)	No Access to Playground (n=74)	Total (N=200)
Severe Thinness (< -3 SD)	10 (7.9%)	9 (12.2%)	19 (9.5%)
Thinness (-3 SD to < -2 SD)	16 (12.7%)	19 (25.7%)	35 (17.5%)
Normal (-2 SD to +1 SD)	89 (70.6%)	33 (44.6%)	122 (61.0%)
Overweight (> +1 SD to +2 SD)	9 (7.1%)	10 (13.5%)	19 (9.5%)
Obesity (> +2 SD)	2 (1.6%)	3 (4.1%)	5 (2.5%)
Total	126 (100%)	74 (100%)	200 (100%)

Among children with access to playgrounds, the majority had a normal BMI-for-age Z-score (70.6%, n = 89). Severe thinness was observed in 7.9% (n = 10), thinness in 12.7% (n = 16), overweight in 7.1% (n = 9), and obesity in 1.6% (n = 2).

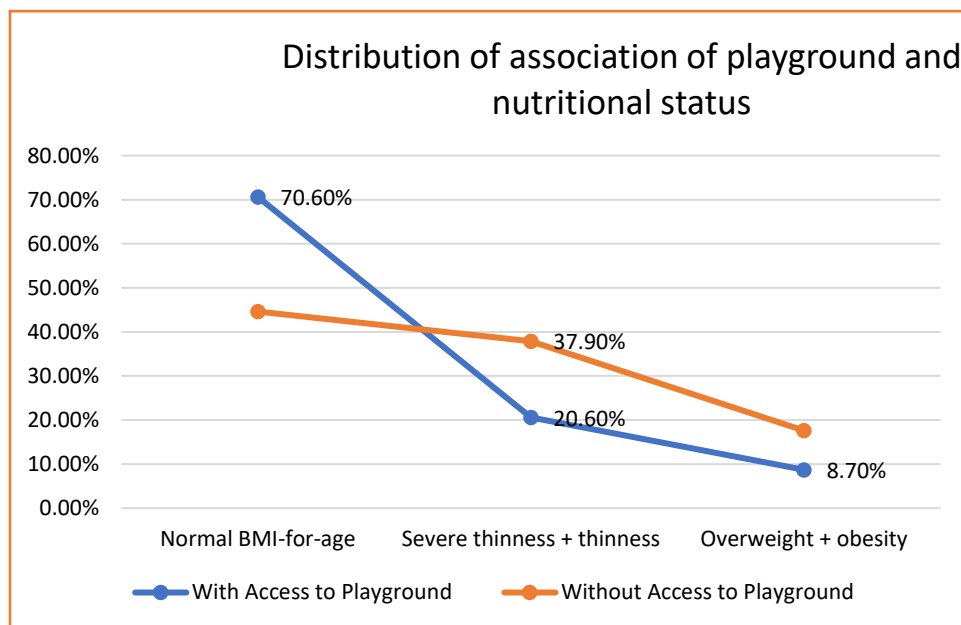
In contrast, among children without access to playgrounds, only 44.6% (n = 33) had a normal BMI-for-age Z-score. Severe thinness was found in 12.2% (n = 9), thinness in 25.7% (n = 19), overweight in 13.5% (n = 10), and obesity in 4.1% (n = 3).

Overall, normal BMI-for-age status was substantially higher among children with playground access compared to those without access (70.6% vs. 44.6%). Conversely, the combined prevalence of thinness and severe thinness was higher among children without playground access (37.9% vs. 20.6%), as was the combined prevalence of overweight and obesity (17.6% vs. 8.7%).

A chi-square test revealed a statistically significant association between playground access and BMI-for-age categories ($\chi^2 = 13.67$, $df = 4$, $p = 0.008$), indicating that nutritional status varied significantly by playground access. Children with access to playgrounds were more likely to have normal BMI-for-age, whereas those without access exhibited higher proportions of both undernutrition and excess body weight.

Overall, the findings suggest that access to playgrounds may play an important role in supporting healthy BMI-for-age status among children, likely through increased opportunities for physical activity and outdoor play. In contrast, lack of access may contribute to both undernutrition and overnutrition. These results highlight the importance of ensuring equitable access to safe playgrounds for promoting child health and nutrition.

Figure 20: Association of access to playground and nutritional status



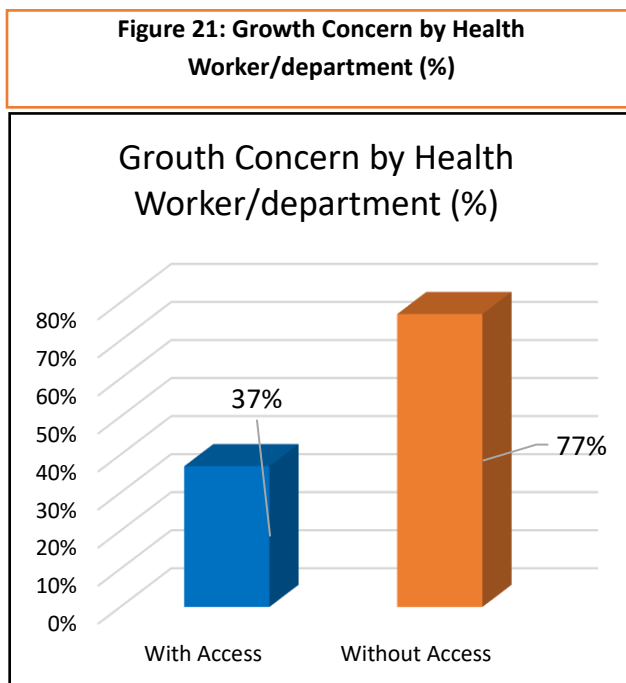
Children without playground access had both higher undernutrition and higher overweight/obesity, suggesting a double burden of malnutrition among this group.

Statistical test: $\chi^2 = 13.67$, $df = 4$, $p = 0.008$, indicating a statistically significant association between access to playground and BMI-for-age category.

4.3.4 Growth Concern by the Health Worker/department about development of his/her children (%)

Growth-related concerns reported by health workers or departments were higher among children without access to playgrounds (77%, n = 57) compared to those with access to playgrounds (37.3%, n = 47).

This indicates that a greater proportion of children without playground access were identified with growth-related concerns. The pattern suggests that lack of access to playgrounds may be associated with poorer growth and physical health outcomes among children.

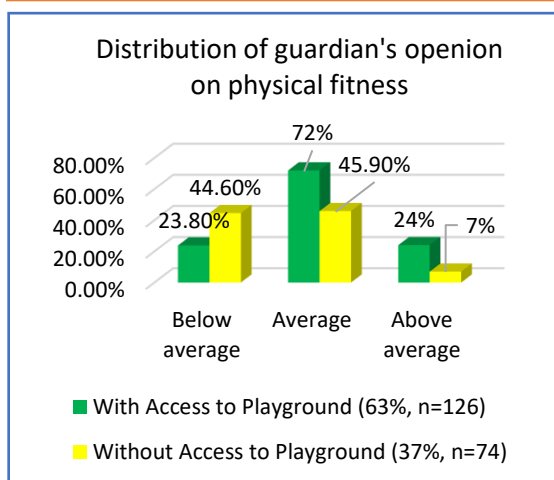


4.3.5 Compared to Peers, Child's Physical Fitness: Guardian's Opinion by Access to Playground

The findings indicate that children with access to playgrounds were perceived to have better physical fitness compared to those without playground access. Among children with playground access, 57.1% were rated as having average fitness and 19.0% were rated as above average. In contrast, among children without playground access, a higher proportion, 44.6%, were rated as below average.

This suggests that access to playgrounds may positively influence children's physical fitness by providing opportunities for outdoor play, running,

Figure 22: Distribution of guardian's opinion on physical fitness



sports, and other physical activities. Children without access to playgrounds showed a higher level of below-average fitness, indicating that limited access to safe play spaces may reduce opportunities for regular physical activity.

4.4: Mental Health & Psychosocial Well-Being

4.4.1 WHO- Mental Well-being Index

Table-10: Mental wellbeing comparison

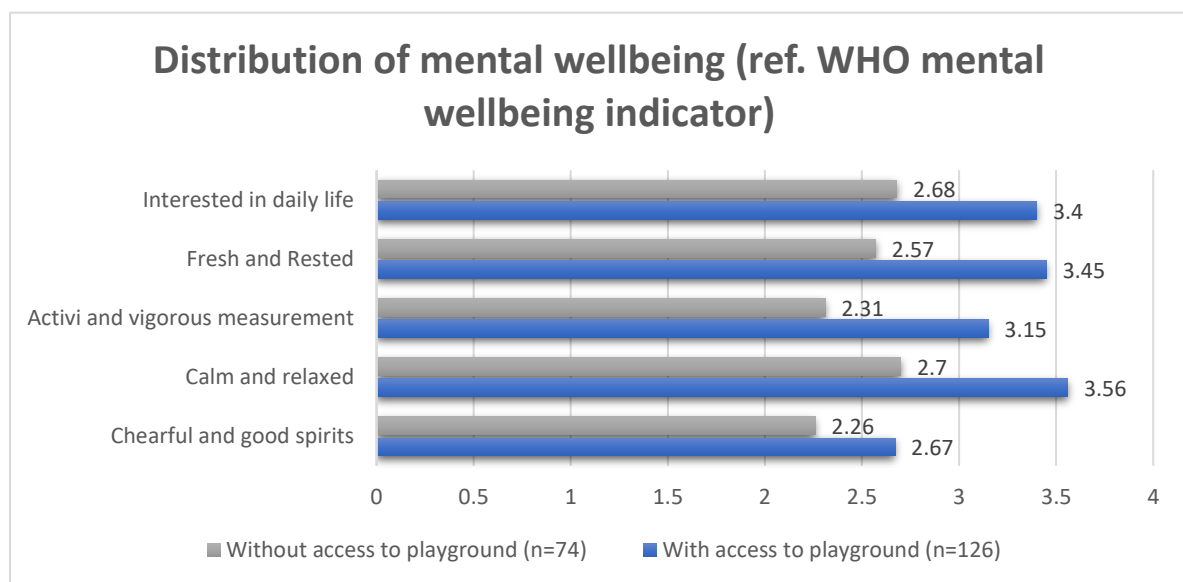
Measurement Indicators of WHO (mental Well-Being index)	With Access to Playground (63%, n=126)							Without Access to Playground (37%, n=74)						
	5=All of the time	4=Most of the time	3=More than half the time	2=Less than half the time	1=Some of the time	0=At no time	Total	5=All of the time	4=Most of the time	3=More than half the time	2=Less than half the time	1=Some of the time	0=At no time	Total
Has Your Children (x) have felt cheerful and in good spirits	17 (14%)	9 (7%)	49 (39%)	23 (18%)	23 (18%)	5 (4%)	126 (100%)	6 (8.1%)	4 (5.4%)	21 (28.4%)	21 (28.4%)	16 (21.6%)	6 (8.1%)	74 (100%)
Has your children felt calm and relaxed/	32 (25%)	30 (24%)	45 (36%)	14 (11%)	5 (4%)	0 (0%)	126 (100%)	9 (12.2%)	10 (13.5%)	24 (32.4%)	16 (21.6%)	11 (14.9%)	4 (5.4%)	74 (100%)
Has your child felt active and vigorous	21 (17%)	23 (18%)	50 (40%)	18 (14%)	14 (11%)	0 (0%)	126 (100%)	5 (6.8%)	7 (9.5%)	22 (29.7%)	18 (24.3%)	16 (21.6%)	6 (8.1%)	74 (100%)
Has the children woke up feeling fresh and rested?	14 (11%)	44 (35%)	58 (46%)	5 (4%)	5 (4%)	0 (0%)	126 (100%)	4 (5.4%)	12 (16.2%)	26 (35.1%)	16 (21.6%)	12 (16.2%)	4 (5.4%)	74 (100%)
Has your children's daily life been filled with things that interest you?	18 (14%)	54 (43%)	30 (24%)	14 (11%)	5 (4%)	5 (4%)	126 (100%)	6 (8.1%)	15 (20.3%)	22 (29.7%)	15 (20.3%)	12 (16.2%)	4 (5.4%)	74 (100%)

The table presents the distribution of WHO mental well-being indicators among children by playground access. Of the 200 respondents, 126 had access to playgrounds, while 74 did not. Responses were recorded on a 6-point scale (0 = “at no time” to 5 = “all of the time”), with scores from 3–5 considered indicative of more positive mental well-being.

Overall, children with playground access consistently reported better mental well-being across all indicators. The strongest positive response was observed for “woke up feeling fresh and rested,” reported by 92.1% (n = 116) of children with access. High proportions also reported feeling calm and relaxed (84.9%, n = 107) and having a life filled with interesting activities (81.0%, n = 102).

In contrast, children without playground access reported comparatively lower levels of well-being. Only 41.9% (n = 31) reported feeling cheerful and in good spirits more than half of the time or more, while 45.9% (n = 34) reported feeling active and vigorous. These findings suggest that limited access to playgrounds may be associated with reduced emotional well-being and lower levels of physical vitality among children.

Figure 23: Mental Wellbeing indicator distribution by access to playground



A clear disparity was also evident in lower well-being responses. Among children without playground access, 58.1% reported feeling cheerful less than half of the time, some of the time, or at no time, while 54.1% reported similarly lower levels of feeling active and vigorous. In comparison, such negative responses were less prevalent among children with playground access.

Overall, the mean mental well-being score was higher among children with playground access (approximately 3.22 out of 5) compared to those without access (approximately 2.50

out of 5). This suggests a positive association between playground access and children's mental well-being, likely through increased opportunities for outdoor play, physical activity, social interaction, and relaxation.

Key findings indicate that children with playground access consistently demonstrated better mental well-being across all five WHO indicators. The most pronounced difference was observed in the proportion reporting feeling fresh and rested (92.1% with access vs. 56.8% without access). Similarly, feelings of activity and vigor were notably lower among children without playground access, indicating reduced levels of physical energy.

Children without access to playgrounds also exhibited a higher prevalence of lower well-being responses, particularly in relation to feeling cheerful and active. Overall, the findings suggest that playground access is positively associated with both emotional and physical well-being among children, although the relationship should be interpreted as correlational rather than causal.

4.4.2 Emotional Well-Being:

Table-11: Comparison of Emotional Wellbeing of the children

Measurement Indicators of WHO (mental Well-Being index)	With Access to Playground (63%, n=126)				Without Access to Playground (37%, n=74)			
	0= Not true	1 = Somewhat true	2 = Certainly true/	Total	0= Not true	1 = Somewhat true	2 = Certainly true/	Total
Has your child often complained of headaches, stomach aches, or sickness?	23 (18%)	94 (75%)	9 (7%)	126 (100%)	9 (12.2%)	52 (70.3%)	13 (17.6%)	74 (100%)
Has your Child appears unhappy, worried, or tearful	32 (25%)	94 (75%)	0 (0%)	126 (100%)	10 (13.5%)	52 (70.3%)	12 (16.2%)	74 (100%)
Child shows confidence in daily activities	9 (7%)	54 (43%)	63 (50%)	126 (100%)	13 (17.6%)	41 (55.4%)	20 (27.0%)	74 (100%)

The findings reveal clear differences in emotional well-being between children with and without playground access. Among children with access, only 7% were reported as

“certainly true” for frequent complaints of headaches, stomach aches, or sickness, compared to 17.6% among those without access. Similarly, no children with playground access were reported as “certainly true” for appearing unhappy, worried, or tearful, whereas this was observed in 16.2% of children without access.

A marked difference was also evident in confidence levels during daily activities. Half of the children with playground access (50%) were reported as “certainly true” for demonstrating confidence, compared to only 27.0% among those without access, indicating lower confidence among children without playground facilities.

Overall, children with playground access exhibited better emotional well-being and higher confidence in daily activities. The findings suggest that playground access is associated with improved emotional health, reduced psychological distress, and enhanced confidence among children in their everyday functioning.

4.4.3 Behavioral & Conduct Aspects:

Table-12: Comparison of Behavioral & conduct Aspect

Measurement Indicators of WHO (mental Well-Being index)	Percentage (%) of With Access to Playground (63%, n=126)				Percentage (%) Without Access to Playground (37%, n=74)			
	0= Not true	1 = Somewhat true	2 = Certainly true/	Total	0= Not true	1 = Somewhat true	2 = Certainly true/	Total
Child often has temper tantrums or anger outbursts	9 (7%)	54 (43%)	63 (50%)	126 (100%)	4 (5.4%)	25 (33.8%)	45 (60.8%)	74 (100%)
Child follows rules at	9 (7%)	28 (22%)	89 (71%)	126 (100%)	11 (14.9%)	34 (45.9%)	29 (39.2%)	74 (100%)

home and school/								
Child is often restless or overactive	14 (11%)	31 (25%)	81 (64%)	126 (100%)	3 (4.1%)	21 (28.4%)	50 (67.6%)	74 (100%)

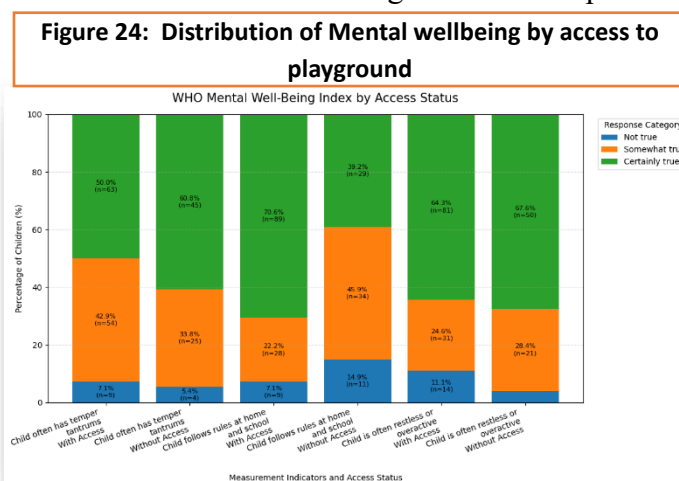
The table presents behavioral and emotional well-being indicators of children according to access to playgrounds. Among the total respondents, 126 children had access to playgrounds and 74 children did not have access. Responses were categorized as “0 = Not true,” “1 = Somewhat true,” and “2 = Certainly true.”

For the indicator “Child often has temper tantrums,” 50.0% of children with playground access were reported as “certainly true,” compared to 60.8% among children without playground access. This indicates that temper tantrums were more frequently reported among children without access to playgrounds.

Regarding rule-following behavior, 71.0% of children with playground access were reported as “certainly true” for following rules at home and school. In contrast, only 39.2% of children without playground access were reported in this category. This shows that children with playground access demonstrated better rule-following behavior compared to those without access.

For restlessness or overactivity, 64.0% of children with playground access were reported as “certainly true,” while this proportion was slightly higher among children without access, at 67.6%. This suggests that restlessness or overactivity was somewhat more common among children without playground access.

Overall, the findings indicate that children with access to playgrounds showed comparatively better behavioral well-being, particularly in following rules at home and



school. Children without access to playgrounds showed higher proportions of temper tantrums and restlessness/overactivity, suggesting that limited access to outdoor play spaces may be associated with poorer behavioral outcomes.

Short finding: Children without access to playgrounds showed a higher proportion of temper tantrums and restlessness/overactivity. In contrast, children with playground access showed better rule-following behavior, with 71% reported as “certainly true,” compared to 39.2% among children without access.

4.4.4 Peer Relationship & Social Skills

Table-13: Comparison of Peer Relationship & Social Skills

	With Access				Without Access			
<i>Measurement Indicators of WHO Mental Well-Being Index</i>	0 = Not true	1 = Somewhat true	2 = Certainly true	Total	0 = Not true	1 = Somewhat true	2 = Certainly true	Total
<i>Child plays cooperatively with other children</i>	9 (7.1%)	18 (14.3%)	99 (78.6%)	126 (100%)	12 (16.2%)	28 (37.8%)	34 (45.9%)	74 (100%)
<i>Child has at least one close friend</i>	42 (33.3%)	49 (38.9%)	35 (27.8%)	126 (100%)	31 (41.9%)	25 (33.8%)	18 (24.3%)	74 (100%)
<i>Child prefers to play alone rather than with peers</i>	54 (42.9%)	32 (25.4%)	40 (31.7%)	126 (100%)	18 (24.3%)	22 (29.7%)	34 (45.9%)	74 (100%)

The table presents peer relationship and social skill indicators among children by playground access. Of the total respondents, 126 children had access to playgrounds, while 74 did not. Responses were categorized as “0 = Not true,” “1 = Somewhat true,” and “2 = Certainly true.”

For cooperative play, a substantially higher proportion of children with playground access (78.6%, n = 99) were reported as “certainly true” compared to those without access

(45.9%). This suggests that playground availability may facilitate cooperative interaction and peer engagement.

Regarding close friendships, 27.8% of children with playground access were reported as having at least one close friend, compared to 24.3% among those without access. However, a higher proportion of children without playground access (41.9%) were reported as “not true” for having close friendships compared to those with access (33.3%), indicating weaker peer bonding in the absence of playground facilities.

For the indicator “prefers to play alone rather than with peers,” a higher proportion of children without playground access (45.9%) were reported as “certainly true,” compared to 31.7% among children with access. As solitary play reflects reduced peer engagement, this finding suggests greater social isolation among children lacking playground access.

Overall, children with playground access demonstrated stronger peer relationships and social skills than those without access. Playground availability appears to support cooperative play, friendship formation, and peer interaction.

Key findings indicate that cooperative play showed the largest difference (78.6% vs. 45.9%), while lack of close friendship and preference for solitary play were more common among children without playground access. Overall, the pattern suggests a positive association between playground access and children’s social development, although the findings are descriptive and do not establish causality.

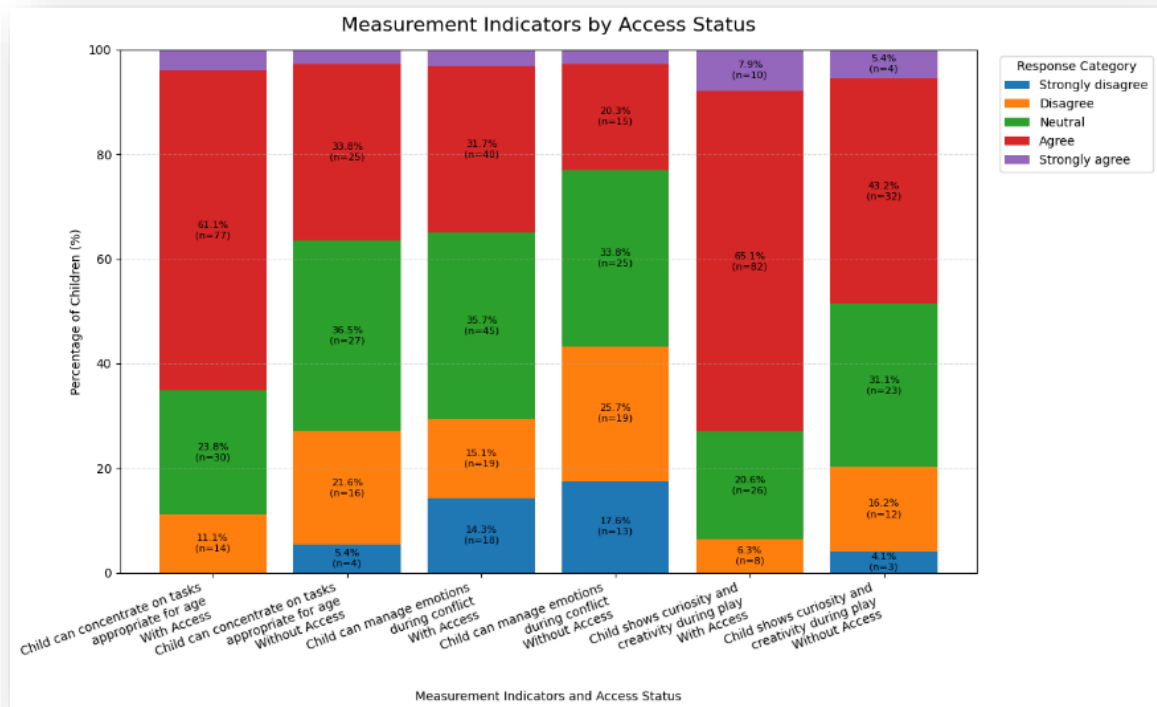
4.4.5 Cognitive & Emotional Regulation

Table-14: Comparison of Cognitive & Emotional Regulation

	With Access						Without Access					
Measure ment Indicator s	1 = Stron gly disagr ee	2 = Disag ree	3 = Neut ral	4 = Agr ee	5 = Stron gly agree	Total	1 = Stron gly disagr ee	2 = Disag ree	3 = Neutr al	4 = Agre e	5 = Stron gly agree	Total
Child can concentra te on tasks appropria te for age	0 (0%)	14 (11%)	30 (24%)	77 (61)	5 (4%)	126 (100)	4 (5.4%)	16 (21.6)	27 (36.5)	25 (33.8)	2 (2.7%)	74 (100)
Child can manage emotions during conflict	18 (14%)	19 (15%)	45 (36%)	40 (32)	4 (3%)	126 (100)	13 (17.6)	19 (25.7)	25 (33.8)	15 (20.3)	2 (2.7%)	74 (100)
Child shows curiosity and creativity during play	0 (0%)	8 (6%)	26 (21%)	82 (65)	10 (8%)	126 (100)	3 (4.1%)	12 (16.2)	23 (31.1)	32 (43.2)	4 (5.4%)	74 (100)

The findings show that children with access to playgrounds had better cognitive and emotional development indicators compared to children without access. Among children with playground access, 65% agreed and 8% strongly agreed that the child shows curiosity and creativity during play. Similarly, 61% agreed that the child can concentrate on age-appropriate tasks.

Figure 25: Distribution of cognitive & Emotional wellbeing



In comparison, children without access to playgrounds showed lower positive responses. Only 33.8% agreed that the child can concentrate on tasks, and 43.2% agreed that the child shows curiosity and creativity during play. Emotional management during conflict was also comparatively weaker among children without playground access, with higher proportions reporting disagreement or neutral responses.

Key Findings:

- Children with playground access showed better concentration, creativity, and emotional regulation.
- The strongest positive response was found in curiosity and creativity during play among children with access.
- Children without playground access had more neutral and negative responses, especially in concentration and emotional management.

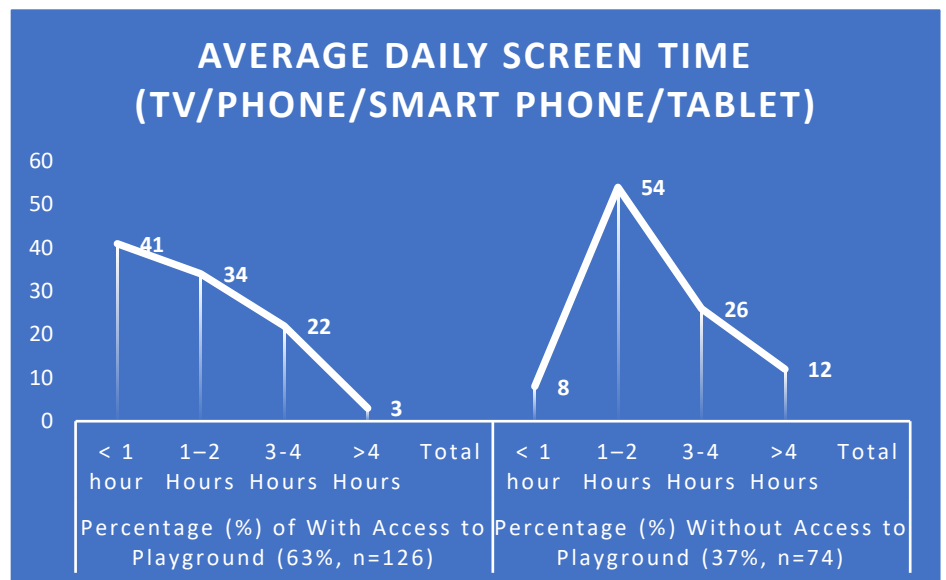
Overall, playground access appears to support children's cognitive, emotional, and creative development.

4.4.6 Screen Time & Sedentary Behavior

4.4.6.1 Average daily distal screening time

The findings indicate that children with playground access had lower daily screen time compared to those without access. Among children with access, 41% reported less than 1 hour of screen time and 34% reported 1–2 hours, meaning 75% spent within 2 hours per day.

Figure 26: Average daily distal screening time



In contrast, only 8% of children without playground access reported less than 1 hour of screen time, while the majority (54%) reported 1–2 hours. Higher screen exposure was also more common in this group, with 38% spending 3 hours or more daily compared to 25% among children with access.

Overall, children without playground access showed a greater tendency toward prolonged screen use, suggesting that lack of playground facilities may contribute to increased sedentary behavior.

Key Highlights

Table-15: Comparison of Average daily screen time (TV/Phone/Smart phone/tablet)

Screen Time & Sedentary Behavior	Percentage (%) of With Access to Playground (63%, n=126)					Percentage (%) Without Access to Playground (37%, n=74)				
	< 1 hour	1–2 Hours	3-4 Hours	>4 Hours	Total	< 1 hour	1–2 Hours	3-4 Hours	>4 Hours	Total
Average daily screen time (TV/Phone/Smart phone/tablet)	41	34	22	3	100% of 126	8	54	26	12	100% of 74

Children with playground access showed healthier screen-time patterns. About 75% of children with playground access had screen time within 2 hours per day. Children without playground access had higher prolonged screen exposure.

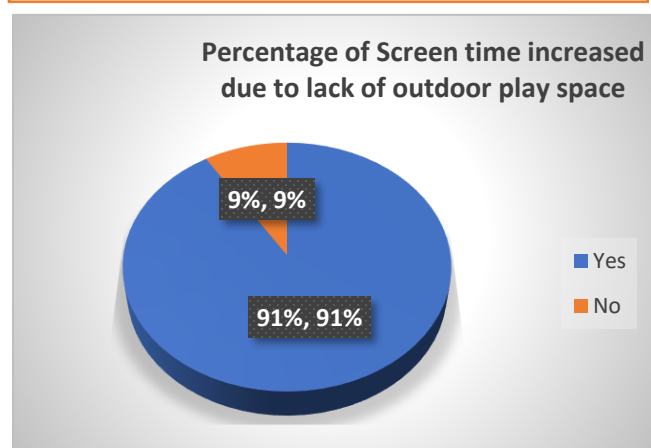
Screen time of 3 hours or more was higher among children without access, 38%, compared to 25% among children with access.

The findings suggest that playground access may help reduce sedentary behavior by encouraging outdoor play and physical movement.

4.4.6.2 Screen time increased due to lack of outdoor play space

The chart shows that a large majority of respondents reported an increase in children's screen time due to the lack of outdoor play space. About 91% answered "Yes," while only 9% answered "No." This indicates that limited access to safe and suitable outdoor play areas may be strongly associated with increased screen use among children. When children do not

Figure 27: Status of screen time influencing to outdoor play



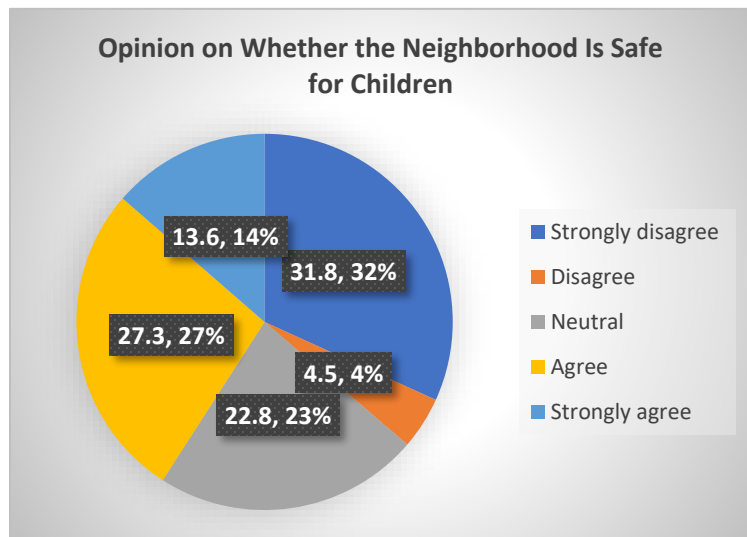
have enough opportunity to engage in physical play, social interaction, or outdoor recreation, they are more likely to spend time on mobile phones, television, or other digital devices. Therefore, the findings highlight the need for child-friendly outdoor spaces to support healthier routines, physical activity, and overall well-being.

4.4.7 Comparative Outcome Assessment

4.4.7.1 Neighborhood is safe for children's outdoor play

The findings show mixed perceptions regarding neighborhood safety for children's outdoor play. Around 40.9% of respondents agreed or strongly agreed that the neighborhood is safe, while 36.3% disagreed or strongly disagreed. Another 22.8% remained neutral. This indicates that although slightly more respondents view the neighborhood as safe, a considerable portion still has safety concerns.

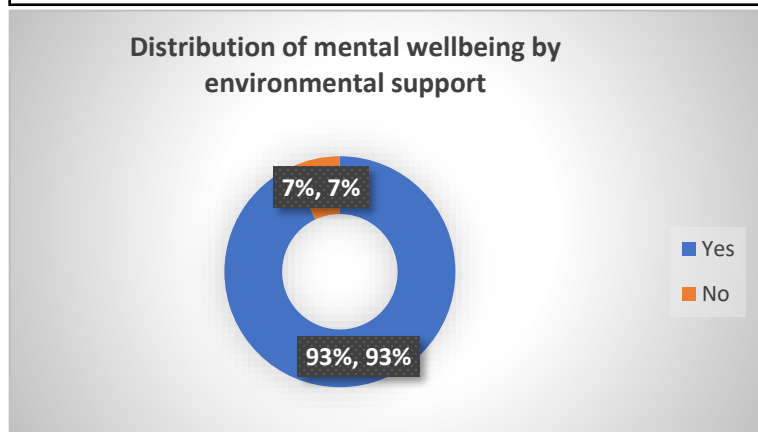
Figure 28: Opinion on Whether the Neighborhood Is Safe for Children



4.4.7.2 Playground environment supports children's mental well-being

The chart shows that 93% of respondents agreed that the playground environment supports children's mental well-being, while only 7% responded negatively. This indicates a strong positive perception of playgrounds as important spaces for children's emotional, social, and psychological development.

Figure 29: Playground environment supports children's mental well-being



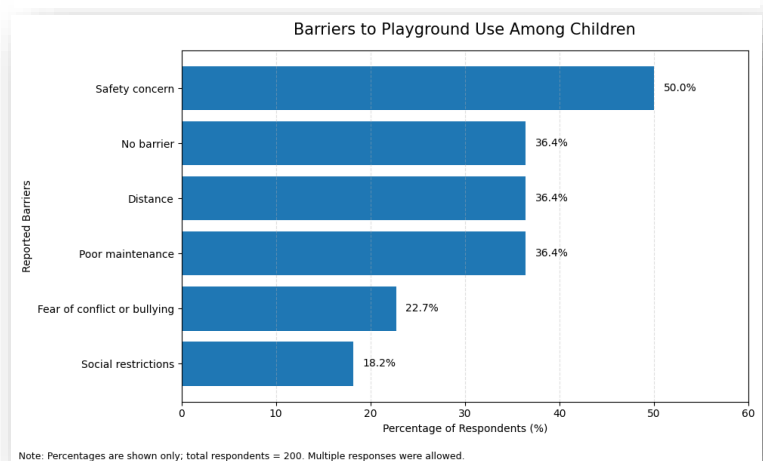
Key Findings:

A large majority believe playgrounds help improve children's mental well-being. Very few respondents disagreed, showing strong community support for safe and child-friendly play environments. Playground environments are widely perceived as beneficial for children's mental well-being.

4.4.7.3 Barriers to playground use:

The chart shows that safety concern is the most common barrier to playground use, reported by 50.0% of respondents. Distance, poor maintenance, and no barrier were each reported by 36.4%. Fear of conflict or bullying was reported by 22.7%, while social restrictions were the least reported barrier at 18.2%.

Figure 30: Using playground barrier to children



Key findings: Safety is the leading barrier to playground use. Distance and poor maintenance also limit children’s access to playgrounds. A notable portion reported no barrier, showing that some children can still use playgrounds without major difficulty. Safety concern is the main barrier, followed by distance and poor maintenance.

4.4.8 Overall Physical and mental well-being of child opinion by mother/guardian of child’s

The survey assessed 200 children to determine their overall physical health and mental well-being. The distribution of responses is as follows:

Overall Physical Health:

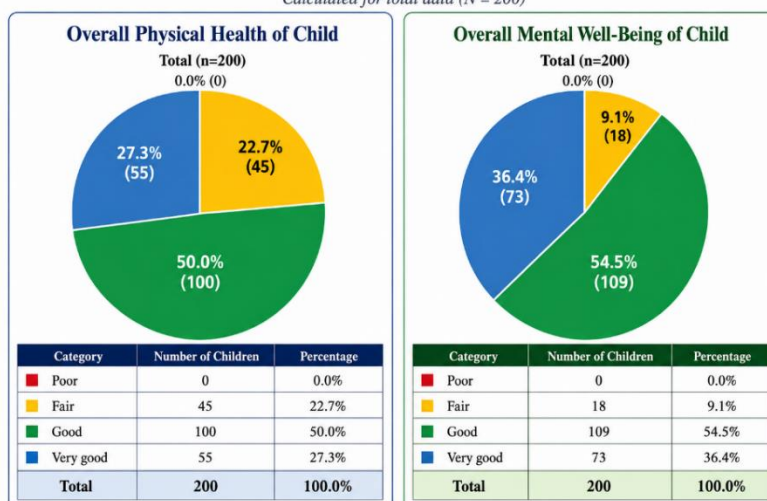
- Very good: 50%
→ 100 children
- Good: 27.3% → 55 children
- Fair: 22.7% → 45 children
- Poor: 0% → 0 children

Overall Mental Well-Being:

- Good: 54.5% → 109 children
- Very good: 36.4% → 73 children
- Fair: 9.1% → 18 children
- Poor: 0% → 0 children

Overall Physical Health & Overall Mental Well-Being of Children

Calculated for total data (N = 200)



Numbers are rounded from the reported percentages to fit N=200.

Figure 31: Overall Physical and mental well-being of child opinion by mother/guardian of child’s

Key Highlights:

- The majority of children exhibited positive physical health, with 50% rated as very good and 27.3% as good. No child was reported in the poor category.
- Mental well-being was also strong, with 54.5% of children rated as good and 36.4% as very good.
- Only a small proportion of children were in the fair category for mental well-being (9.1%), while none were in the poor category for either physical or mental health.
- These findings indicate that most children in the study have favorable physical health and mental well-being, suggesting effective growth, development, and psychosocial support in the study population.
- The pie charts visually emphasize that overall positive health outcomes dominate in both physical and mental domains, highlighting a generally healthy cohort.

This analysis provides a clear overview of the children's health status and can guide interventions targeting the smaller proportion in the fair category.

Chapter Five: Key Findings, Recommendation and Conclusion

5.1 Key Findings of the Study

The study generated several important findings regarding children's access to playgrounds and its association with their physical health, nutritional status, mental well-being, social development, and sedentary behavior.

- i. The study found that 63% of children had access to a playground within 400 meters of their residence, while 37% did not have such access. Playground access was comparatively higher in Nirala Residential Area than in Sonadanga Residential Area, indicating unequal availability of child-friendly outdoor play spaces across the study locations.
- ii. Although more than half of the children had nearby playground access, regular playground use was low. Among children with access to playgrounds, nearly half did not visit a playground at all during the last seven days, and most children who visited spent less than 30 minutes per visit. This indicates that physical access alone may not ensure regular or sufficient use of playground facilities.
- iii. Public playgrounds were the main source of play space for children, while school playgrounds and informal open spaces played a smaller role. During playground visits, children were mostly involved in running and free play, followed by football and cricket, suggesting that playgrounds primarily supported unstructured physical activity.
- iv. The findings showed a significant association between playground access and children's BMI-for-age status. Children with playground access had a higher proportion of normal BMI-for-age compared to children without access. In contrast, children without playground access showed higher levels of both thinness and overweight/obesity, indicating a double burden of malnutrition among this group.

The association between playground access and BMI-for-age category was statistically significant.

- v. Growth-related concerns reported by health workers or departments were substantially higher among children without playground access. This suggests that limited access to outdoor play opportunities may be linked with poorer growth and physical development outcomes.
- vi. Children with access to playgrounds were perceived by guardians to have better physical fitness compared to children without access. A higher proportion of children without playground access were rated as having below-average physical fitness, indicating that the absence of safe play spaces may reduce opportunities for regular movement, exercise, and active play.
- vii. The study found that children with playground access had better mental well-being across all five WHO mental well-being indicators. They were more likely to feel cheerful, calm, active, fresh, rested, and interested in daily life. The average mental well-being score was higher among children with playground access than among those without access.
- viii. Emotional well-being was also better among children with playground access. Children without playground access were more likely to be reported as unhappy, worried, tearful, or physically unwell through complaints such as headaches, stomach aches, or sickness. Children with playground access showed greater confidence in daily activities.
- ix. Behavioral outcomes differed by playground access. Children with playground access demonstrated better rule-following behavior at home and school, while children without access showed higher proportions of temper tantrums, anger outbursts, restlessness, and overactivity.

- x. Playground access appeared to support better peer relationships and social skills. Children with playground access were more likely to play cooperatively with other children, while children without access were more likely to prefer playing alone and showed weaker peer interaction. This indicates that playgrounds may provide important opportunities for socialization, friendship development, and cooperative behavior.
- xi. Cognitive and emotional regulation indicators were stronger among children with playground access. These children showed better concentration, curiosity, creativity during play, and emotional management during conflict compared to children without access.
- xii. Children without playground access had higher screen time and sedentary behavior. A large majority of respondents reported that lack of outdoor play space increased children's screen time. Children without access were more likely to spend three or more hours per day on screens, suggesting that limited outdoor play opportunities may contribute to prolonged digital device use.
- xiii. Safety concern was identified as the leading barrier to playground use, followed by distance and poor maintenance. This indicates that availability of playgrounds alone is not enough; playgrounds must also be safe, accessible, well-maintained, and socially acceptable for children and guardians.

Finally, the overall findings suggest that access to safe and nearby playgrounds is positively associated with children's physical health, normal nutritional status, emotional well-being, social interaction, cognitive development, and reduced sedentary behavior. The study highlights the importance of developing and maintaining child-friendly playgrounds in residential areas to support the holistic development of children.

5.2 Recommendations

Based on the findings of the study, the following recommendations are proposed to improve children's physical, mental, social, and emotional well-being through better access to safe and child-friendly playgrounds:

1. Inadequate Access to Safe and Walkable Playgrounds Requires Strategic Urban Planning and Targeted NGO–Government Collaboration for Child-Friendly Infrastructure Development
2. Child Safety Risks in Playgrounds Highlight the Need for Strengthened Protection Measures, Including Infrastructure Safety, Supervision Systems, and Community-Based Safeguarding Mechanisms
3. Insufficient Maintenance and Poor Condition of Existing Playgrounds Call for Systematic Rehabilitation, Regular Monitoring, and Quality Assurance of Play Facilities
4. Low Utilization of Playgrounds Indicates the Need for Behavior Change Communication (BCC) and Community Mobilization to Promote Consistent Outdoor Physical Activity Among Children
5. School-Based Playgrounds Represent a Critical Entry Point for Expanding Structured Physical Activity and Community Access in Areas with Limited Public Play Spaces
6. Increasing Screen Time and Sedentary Behavior Among Children Due to Lack of Outdoor Opportunities Requires Integrated Interventions Promoting Active Lifestyles and Digital Use Management
7. Playgrounds Serve as Multi-Dimensional Development Spaces Supporting Children's Physical, Emotional, Social, and Cognitive Well-Being Beyond Physical Activity Alone
8. Observed Variations in BMI-for-Age and Growth Patterns Indicate the Need for Integrated Nutrition, Health Screening, and Physical Activity Promotion Programs
9. Community Engagement and Local Ownership are Essential for Sustainable Playground Management, Safety Assurance, and Long-Term Functionality of Child-Friendly Spaces

10. Further Research is Required in Diverse Urban and Peri-Urban Settings to Establish Evidence on Causal Relationships Between Playground Access and Child Development Outcomes.

5.3 Conclusion

The present study explored the relationship between access to playgrounds and the physical, mental, behavioral, and social well-being of children in selected residential areas. The findings indicate that playground access is an important factor associated with children's overall development. Although more than half of the children had access to a playground within walking distance, a substantial proportion still lacked such access, demonstrating an important gap in child-friendly recreational infrastructure.

The study found that children with access to playgrounds showed more favorable outcomes in several domains. They were more likely to have normal BMI-for-age status, better perceived physical fitness, improved mental well-being, higher confidence, better rule-following behavior, stronger cooperative play, and greater curiosity and creativity during play. In contrast, children without access to playgrounds showed higher levels of growth concern, abnormal BMI-for-age status, lower emotional well-being, weaker peer interaction, greater preference for solitary play, and higher screen-time exposure.

The findings also highlight that access alone is not sufficient. Many children who had access to playgrounds did not use them regularly or for long durations. This suggests that factors such as safety, distance, poor maintenance, social restrictions, and fear of conflict or bullying may influence actual playground utilization. Therefore, improving the availability, safety, quality, and usability of playgrounds is essential for maximizing their benefits.

Overall, the study suggests that safe and accessible playgrounds can contribute positively to children's physical activity, nutritional status, emotional health, social interaction, and cognitive development. However, the findings should be interpreted as associations rather than direct causal relationships. Ensuring equitable access to well-maintained and child-friendly playgrounds should be considered an important public health, urban planning, and child development priority. Strengthening playground facilities, reducing barriers to use, and promoting regular outdoor play may help support healthier and more balanced development among children.

References

- I. Koipysheva, E., Kuleshov, A., & Petrova, N. (2018). Physical health as a multidimensional construct: Biological, physiological, and functional perspectives. *International Journal of Health Sciences*, 12(4), 45–54.
- II. Ługowska, A., Nowak, R., & Kowalski, M. (2023). Physical activity and mental well-being in childhood: A comprehensive review. *European Journal of Pediatrics*, 182(5), 1357–1372. <https://doi.org/10.1007/s00431-023-04876-4>
- III. Mani, A., Sharma, R., & Kumar, S. (2012). Role of playgrounds in children's mental health and social development. *International Journal of Child and Adolescent Health*, 5(3), 221–228.
- IV. Pedrosa, R. H., Bitencourt, L., Fróes, A. C., & Figueira, I. (2020). Emotional, behavioral, and psychological impact of the COVID-19 pandemic. *Frontiers in Psychology*, 11, 566212. <https://doi.org/10.3389/fpsyg.2020.566212>
- V. Rigolon, A. (2018). A complex landscape of inequity in access to urban parks: A literature review. *Landscape and Urban Planning*, 178, 136–155. <https://doi.org/10.1016/j.landurbplan.2018.06.003>
- VI. Rowland, T. W., & Freedson, P. (1994). Physical activity and children's health: Physiological and behavioral considerations. *Exercise and Sport Sciences Reviews*, 22, 229–265. <https://doi.org/10.1249/00003677-199400220-00009>
- VII. Shieh, J., & Chang, C. (2014). Playgrounds, physical activity, and children's mental well-being. *Children's Health Care*, 43(2), 122–139. <https://doi.org/10.1080/02739615.2014.875578>
- VIII. UNICEF. (2018). *Child-friendly cities: A framework for action*. UNICEF. <https://www.unicef.org/publications>
- IX. UNICEF. (2021). *The role of urban green spaces in children's health and development*. UNICEF. <https://www.unicef.org/publications>
- X. Vliet, W., & Karsten, L. (2015). Urban parks and children's well-being: The Dutch experience. *Urban Studies*, 52(12), 2271–2288. <https://doi.org/10.1177/0042098014527485>

- XI. Wadood, S., Rahman, M., & Ahmed, F. (2021). Mental health status of children in Bangladesh: National survey findings. *BMC Psychiatry*, 21, 400. <https://doi.org/10.1186/s12888-021-03392-x>
- XII. Whitney, J., Smith, K., & Jones, P. (2019). The interconnection between childhood physical activity and mental health: A review. *Pediatric Exercise Science*, 31(2), 143–152. <https://doi.org/10.1123/pes.2018-0076>
- XIII. WHO. (2022). *Mental health: Strengthening our response*. World Health Organization. <https://www.who.int/news-room/fact-sheets/detail/mental-health-strengthening-our-response>
- XIV. Wilson, R. (2022). Urban green spaces and child development: Implications for public policy. *Landscape Research*, 47(5), 609–622. <https://doi.org/10.1080/01426397.2021.1998762>