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*Review Article*

# Navigation of Research Methodologies on Health and Academic Performance of Left-Behind Children: A Systematic Review

Sushil Sharma[1*]; Bhimsen Devkota[2]
[1]Prithvi Narayan Campus, Pokhara, Tribhuvan University, Nepal
[2]Mahendra Ratna Campus, Kathmandu, Tribhuvan University, Nepal
***Corresponding author**
Email: sushil.bhattarai@prnc.tu.edu.np,
ORCID: https://orcid.org/0000-0002-1982-0506

**Abstract**

This study focuses on the methodology used to study the health and academic performance of left-behind children (LBC). It examines and analyses the research design, sample, sampling techniques, research tools etc. to assess their uses. The study reflects and represents the context of various countries including Bangladesh, China, Ghana, Nepal during 2010 to 2020. In this methodology 11 studies out of 27 used cross-sectional design. The review followed preferred reporting items for systematic reviews and meta-analyses (PRISMA) guidelines, using JSTOR, Hinari, PubMed and, WorldCat database. These databases provided extensive coverage of relevant literature, and key search terms like 'parental international migration', 'left-behind children', 'well-being', and 'academic performance'. An initial search of 16,786 articles were narrowed down to 27 studies that met inclusion criteria. Almost all the studies were of quantitative research design effective to capture the relation between parental migration and child well-being and academic performance. The methodology relied on quantitative tools like the self-reported questionnaires, strength and difficulties questionnaires and standardized tests. These tools were important in assessing emotional, behavioral, and academic performance. Anthropometric measurements were widely used to evaluate nutritional status. However, in-depth interview and semi-structured interview were rarely employed despite their value to provide rich and contextual information. Sampling methods varied, with a few studies employing probability proportional sampling for representative data, while others used purposive sampling. The review highlights the need for more longitudinal studies, mixed-method approaches, and broader geographical representation.

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## Introduction

In recent decades, international migration has become a defining feature of globalization, with millions of individuals moving across borders in search of better economic opportunities (International Organization for Migration, 2021). This phenomenon has been particularly prominent in the developing regions like South Asia, Africa, and Latin America, where many families rely on remittances sent home by migrant workers (Ministry of Labour, Employment and Social Security, 2020). Migration has brought significant economic benefits to these countries, contributing to household incomes and national economies (Ministry of Labour and Employment, 2018). However, this large-scale movement of labor has far-reaching social

implications, particularly for the families left behind, and most notably, for LBC, who are often at the center of ongoing debates about the impacts of migration (International Organization for Migration, 2018)

The effects of parental migration on the LBC have been a key area of research in various countries like Nepal (Adhikari, 2019), the Philippines (Lam & Yeoh, 2019) and Mexico (Wassink & Viera, 2021); and they have been at the forefront of this discourse due to their high rates of labor migration (Sharma et al., 2021). Several studies have examined how remittances sent by the migrant parents influence the well-being, and academic performance of LBC. These studies often explore the balance between economic advantages and the emotional and psychological challenges faced by the children separated from their parents for extended periods (Davis-Kean et al., 2021).

Research on LBC spans various disciplines, including sociology, psychology, economics etc., reflecting the complexity of the issue. Consequently, the methodologies used in these studies vary widely, from large-scale quantitative surveys to small, qualitative case studies. This diversity in approach allows for a deeper exploration of the impact of migration on children, but it also introduces challenges in terms of comparability and consistency of findings. As the global landscape of migration continues to evolve, it becomes increasingly important to assess how well current research methodologies are capturing the distinctiveness of LBC's experiences across different cultural and socio-economic contexts (International Labour Organization, 2018).

To address these issues, a critical review of the research methodologies employed in the study of LBC is important. This article aims to systematically analyze the various approaches that have been applied to examine the well-being and academic performance of LBC. By focusing on the strengths and limitations of these methodologies, this review highlights the key patterns and gaps in the existing literature. It also provides valuable insights into how research methods can be refined to better capture the unique experiences of LBC, offering guidance for future studies in this field. So, this study seeks to systematically review and analyze the research methodologies, used in studying the well-being and academic performance of LBC in relation to parental international migration (PIM).

## Methods and Materials

This review employs a methodological approach to critically analyze the existing literature on the well-being and academic performance of LBC in the context of PIM. By synthesizing findings from various studies, the review aims to identify gaps in research methodologies and suggest the areas for further investigation. The review adapts the PRISMA guidelines to ensure a rigorous approach to the literature review process. It explores the key search terms encompassing precise keywords, such as 'parental international migration,' 'left-behind children,' 'well-being,' and 'academic performance'. These terms are utilized in conjunction with logical connectors 'OR' (within columns) and 'AND' (between columns). Regarding the inclusion and exclusion criteria, only those articles that met the inclusion criteria were chosen for review and assessment. The sample for this review consists of the research articles published between 2010 and 2020 that focus on LBC affected by PIM. The selection

process follows the inclusion and exclusion criteria detailed in Table 1, which ensures that only the relevant and high-quality studies are considered. The table shows the specified criteria for inclusion and exclusion of the articles for the purpose of systematic review (Mengist et al., 2020).

**Table 1**

*Inclusion and Exclusion Criteria*

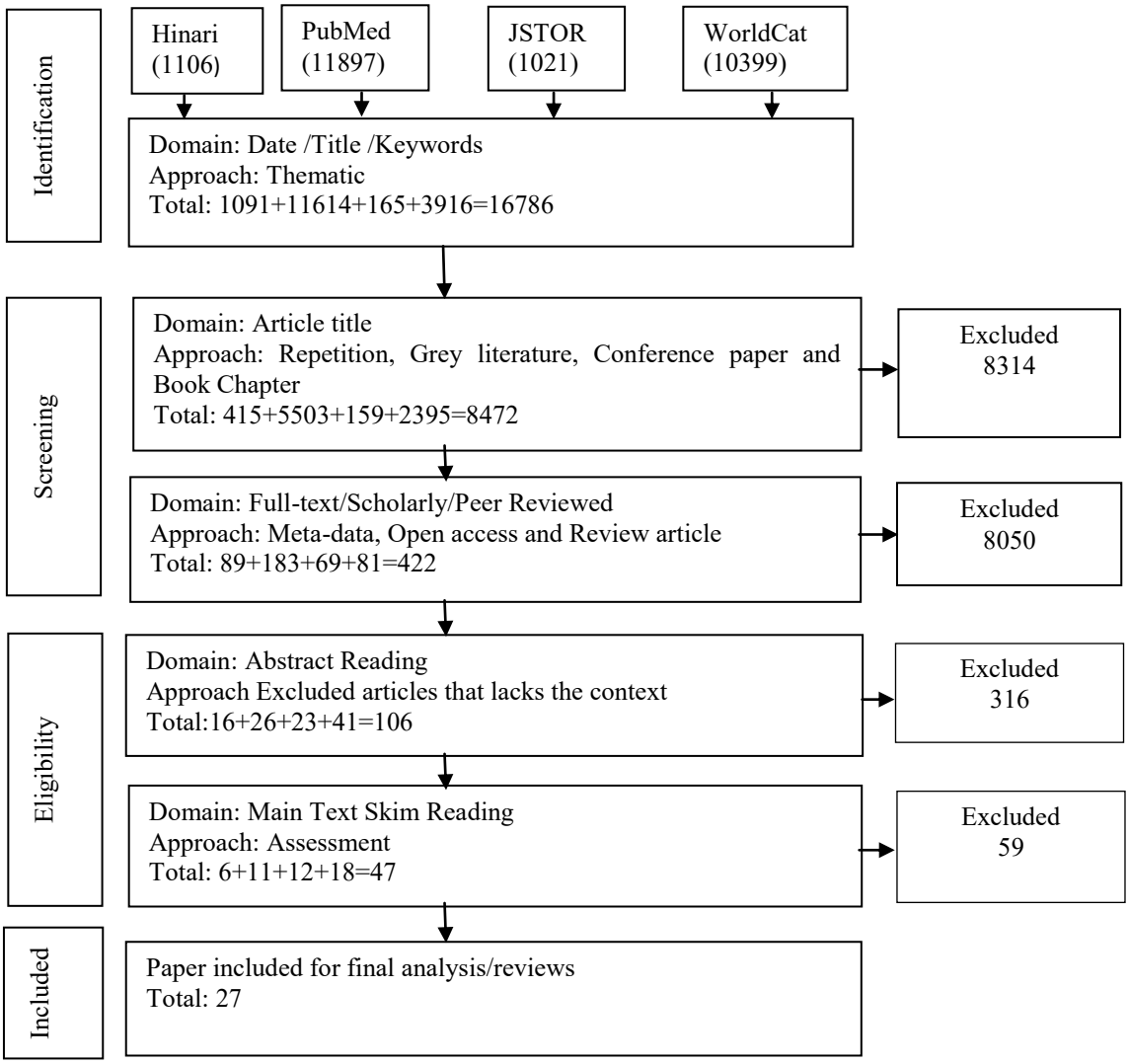
| Criteria | Decision |
|---|---|
| When the predetermined keywords appear throughout the manuscript, or at least in the title, keywords, and abstract sections. | Inclusion |
| The paper was published in a peer-reviewed journal | Inclusion |
| The manuscript should be published in English | Inclusion |
| When the papers addressed at least methodological indication. | Inclusion |
| The online platform such as Hinari, PubMed, JSTOR and WorldCat | Inclusion |
| Papers that are replicated in the search documents | Exclusion |
| Unavailable publications, review papers, and meta-data | Exclusion |
| Papers that are neither primary nor original research | Exclusion |
| Research papers that published before 2010 and after 2020. | Exclusion |

Table 1 presents the criteria used to choose research papers for inclusion or exclusion in the study: Papers published that must meet numerous criteria, including being published in peer-reviewed journals, being written in English, and providing evidence on synergic/trade-off explorations. Furthermore, inclusion necessitates that the studies address methodological issues. The articles that are replicated in the search documents, inaccessible publications, review articles, meta-data, and those that are not primary, and those not based on original research were all excluded. This selection method was designed to ensure that only relevant, original research publications that meet particular criteria were considered for inclusion in the study. The general screening procedures and the flow of choosing pertinent literature (Page et al., 2021) were presented in Figure 1.

Figure 1 shows the number of appropriate papers found, and the final number included in this review. In the first step, 16786 records were found (1106 from Hinari, utilizing advanced search techniques, 11897 from PubMed, 1021 from JSTOR, and 10399 from WorldCat). After excluding the works of literature such as grey literature, extended abstracts, presentations, keynotes, book chapters, non-English language papers, and inaccessible publications, the number of articles was reduced to 8472 for further title reading. Following that, only 422 articles met the qualifying requirements for additional abstract reading. After reviewing the abstracts, just 106 papers remained for the main body reviewing. Moreover, only 47 papers of them were evaluated, and those articles were downloaded for additional screening. During the main body reading, twenty duplicate papers and pieces with unclear context were manually deleted. Finally, 27 papers met all the inclusion criteria for this study.

**Figure 1**

*The Flow Diagram of Search Strategy for the Systematic Reviews*




## Findings

Various research designs, samples, methods, tools were devised to analyze and assess the well-being and academic performance of LBC. In reviewing the methodology, research designs, population and samples, methods and tools are of the utmost concern. Different methodological procedures were used in different countries and contexts. In this study, concerning LBC, it has interpreted and analyzed the different methodological procedures.

Table 2 shows the diversities in focus area, design, sample size, sampling methods, and tools. Among the 27 studies, 11 employed a cross-sectional design, which are most common due to their ease of implementation, though they are limited in assessing the long-term changes. Only 2 studies used a longitudinal design, which allowed for more in-depth tracking of changes

over time, though with more resource requirements. Mixed methods were also employed in several studies to provide a holistic analysis of both qualitative and quantitative data.

Sample sizes varied greatly: While the largest sample size included 23,402 children offering a comprehensive analysis of nutritional disorders, other smaller studies included only 60 students, limiting generalizability. Several studies, such as Bai et al. (2018) and Tang et al. (2019), used larger samples (13,000 students and 1,160 LBC, respectively), strengthening the statistical power of their findings. In terms of sampling methods, random sampling was the most frequently used, which provided more representative findings. Purposive sampling was applied in more targeted studies to focus on specific populations, while stratified and multi-stage sampling was employed in more complex research designs such as those by Vanore (2015) and Mo et al. (2016) to ensure diverse representation.

In terms of tools, many studies used standardized instruments like the SDQ and SAQ for consistent and quantifiable data collection. Qualitative tools like SSI and IDI were used in mixed-method studies to gather richer, more narrative data, although these tools are harder to generalize. Most studies focused on the health, well-being, and academic achievement of LBC, with a smaller number addressing psychological development and nutritional status.

**Table 2**

*Studies for a Methodological Review on Health and Academic Performance of LBC*

| Authors and Date | Place | Source of Review | The focus of the Study | Design | Sample | Sampling | Tools |
|---|---|---|---|---|---|---|---|
| Islam et al. (2019) | Bangladesh | Public health nutrition | Nutritional disorders of LBC | Cross-sectional/ Cluster survey | 23402 children (aged<5years), | Probability proportional/ Systematic | Multiple indicator |
| Luo et al. (2019) | Hunan Province China | International journal of environmental research and public health | Emotional and behavioural problems | Cross-sectional survey design | 557 LBC from 3 to 5 years | Random cluster sampling | Strength and difficulties questionnaires (SDQ), Self-administered questionnaire (SAQ) |
| Tang et al. (2019) | Sichuan Province of China | BMC International health and human rights | Physical and mental well-being | Cross-sectional study | Students: 1160 LBC and 580 NLBC (aged 12–15 years). | Multi-stage / Cluster sampling | Standardized test (ST) |
| Wang et al. (2019) | Anhui Province China | International journal of environmental research and public Health | Mental well-being of current and previous LBC as compared to NLBC. | Quantitative/ Cross-sectional study | 1251current-LBC, 473 previous-LBC, and 268 never-LBC (Grades 5–8, aged 11 to 17) | Random sampling | Self-reported questionnaires (SRQ) |
| Adhikari (2019) | Chitwan Nepal | Journal of management, technology & social sciences | LBG education, health and psychosocial development | Mixed | 220 and 5 girls (2-5 years pre-school, 5-10 years primary school, 10-16 years as the secondary school) | Purposive/ Random sampling | Survey questionnaires (SQ), Semi-structured interview (SSI) |
| Bai et al. (2018) | North-western China | Journal of development studies | Academic performance of LBC | Quantitative | 13,000 students from 130 primary schools | Random sampling | ST |
| Jampaklay et al. (2018) | Thailand | Asian and pacific migration journal | Impact of parental absence on childhood development | Longitudinal study and mixed-method | Children aged 36 months (n = 923). | Purposive | Denver development screening test (DDST), In-depth interview (IDI) |
| Liu et al. (2018) | Hubei, China | Frontiers in Psychology | Investigate differences in theory of mind between LBC and NLBC | Mixed | 213 Children aged 7.10–13.67 years (111 boys and 102 girls | Random Sampling | Strange stories test (SST), Raven's standard progressive matrices (RSPM) |
| Odoh, et al.(2018) | Nigeria | Research on humanities and | Academic performance | Quantitative Survey design | 60 out of the 150 students | Purposive and Random | Structured questionnaire (SQ) |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | social sciences | | | | sampling | |
| Song et al. (2018) | Hubei, China | Children | Life satisfaction and academic achievement of LBC and NLBC | Case study | 1031 LBC and 992 NLBC students in grades 4 -9 in 10 elementary and 4 middle schools aged between 8 -16 years. | Survey/ All students are voluntarily selected | ST /Satisfaction with life scale (SWLS) |
| Walter (2018) | Kericho, Kenya | World journal of innovative research | Students' Academic performance | Causal comparative, Descriptive survey | 21 secondary school and 210 students | Purposive/ Stratified/ Multistage | The closed and open-ended questionnaire |
| Malqvist, Singh, & Kc (2017) | Nepal | Scandinavian journal of public health | Prevalence of fever/cough and diarrhoea in Nepal | Quantitative analysis | 2001 n = 6978<br>2006 n = 5545<br>2011 n = 5306<br>2014 n = 5349 | Representative sample U5 from NDHS | Multiple indicator cluster survey |
| Beh (2017) | Chongqing, China | Copenhagen journal of Asian studies | Development and Challenges for the Future | Mixed | 295 Junior students and 49 teachers | Internet survey and Secondary sources | Interview with semi-structured questionnaire (SSQ) |
| Fu et al. (2017) | Jiangsu, China | Frontiers in education | Investigate the academic achievement | Mixed | Children (9-17) 1,761 NLBC and 1,315 LBC (9 primary & 3 secondary schools | Participation in the study was entirely voluntary | SAQ, ST |
| Lu, Lin, Vikse, & Huang (2016) | China (9 provinces) | International journal of social welfare | Residency status, education, health and well-being parenting, and personal values | Longitudinal survey | 4,400 Households (Children aged 6-18) | Multistage, random clustered sampling | Interview with SAQ, AM |
| Mo et al. (2016) | Shandong China | European journal of public health | Wasting, Overweight and Obesity of LBC | Quantitative/Cross-sectional study | 735 Children ages 3–6 years | Stratified cluster survey/ Random | SSQ, AM |
| Mazzucato et al. (2015) | Ghana, Nigeria, and Angola | Social science &medicine | Psychological well-being of LBC | Quantitative | Ghana, (23school & 2760 students), Nigeria (27 & 2168), and Angola, (25 & 2243) aged 11-21 | Stratified/ Random sampling | SDQ |
| Puerta (2015) | Colombia | Psychologia | Relationship between the cognitive processes and the academic performance | Quantitative/ Non-experimental co relational with a cross-sectional design | Participants were 60 students between 14 and 17 years old | Randomly selected | A neuropsychological battery |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Vanore (2015) | Moldova and Georgia | Maastricht University | Psychosocial health | Quantitative analytical methods. (Nationally-representative household survey) | 1,282 children below the age of 18 | Multi-stage sampling design/ stratified random sampling | SDQ |
| Botezat & Pfeiffer (2014) | Romania | ECONSTOR Centre for European economic research. | LBC: school achievement and mental & physical well-being | Quantitative | 291 School children, | Representative survey | Grade point average (GPA), SAQ |
| Iqbal et al.(2014) | Punjab province Pakistan | Open journal of social sciences | Education of LBC | Qualitative | 12 migrants | Purposive/ Convenient sampling | SSI and IDI |
| Appianing (2013) | Ghana, Ningo-prampram district | The University of Ghana, College of Humanities, Centre for Migration Studies. | Health and well-being of LBC | Mixed/Cross-sectional | 80 School children (15-17 years) and 40 Caregivers | Purposive sampling | SQ |
| Adhikari (2012) | Thailand Kanchanaburi province | Faculty of Graduate Studies, Mahidol University. (Online) | Health and of children living separately from parents | Mixed /Survey | 1027 Children (508 from Age 3-5 & 519 Age 9-11) | Quota Sampling | SAQ, AM, SDQ |
| Graham & Jordan (2011) | Indonesia Philippine, Thailand, Vietnam | Journal of marriage and family | Psychological well-being of LBC | Mixed/ Cross-sectional baseline study | Under age 12 Students 3,876 | Quota Sampling | SDQ |
| Nanthamongkolchai et al. (2011) | Phrae Province China | Asia pacific journal of public health | Compare the health status of children aged between 6 and 12 years reared by grandparent and parents. | Quantitative/ Cross-sectional | 160 children with a grandparent as the main caregiver, and another 160 with the parent | Cluster sampling | Interviewed with SSQ, AM |
| Gao et al. (2010) | Guangdong, China | BMC Public health | Health status and health behaviour of LBC | Quantitative/ Cross-sectional study | 2986 (5 middle school students) | Census | SAQ, Calibrated scales, |
| Jia &Tian (2010) | Shandong, China | Child care health and development | Psychological well-being of children | Community-based cross-sectional study | 324 LBC & 282 NLBC (8-14 years). | A stratified two-stage cluster survey | Interview with SSQ |

## Discussions

This study provides an overview of the key methodological dimensions in the selected studies, including authors, publication dates, study locations, sources of review, research focus, study design, sample size, sampling methods, and tools employed. The results are discussed based on the key factors of methodological navigations which is presented in figure 2.

**Figure 2**

*Methodological Navigations*

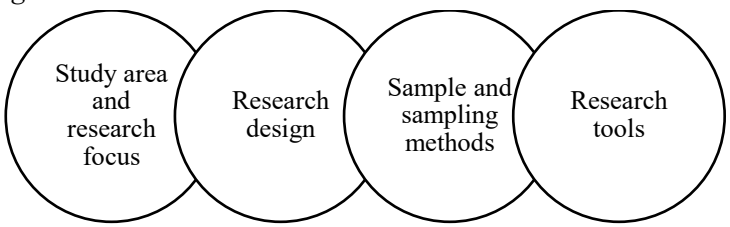



Figure 2 presents the result of methodological review based on key dimensions like; study area and research focus, research design, sample and sampling procedure, and research tools.

### Study Area and Research Focuses

The selected studies on the impact of parental absence on LBC were conducted in a diverse set of countries, spanning various regions and cultural contexts. These studies provided valuable insights into how parental absence affects LBC's well-being and academic performance across different settings. It provides an overview of various research studies conducted between 2010 and 2020, focusing on the well-being, education, and development of LBC in different regions and countries. The studies cover a wide range of topics, reflecting the diverse challenges and implications of parental absence on LBC.

The research locations included countries such as Bangladesh (Islam et al., 2019), China (Fu et al., 2017; Liu et al., 2018; Wang et al., 2019), Nepal (Adhikari, 2019; Malqvist et. al., 2017), Thailand (Adhikari, 2012; Jampaklay et al., 2018), Kenya (Walter, 2018), Nigeria (Odoh, et al., 2018), Ghana (Appianing, 2013), Angola (Mazzucato et al., 2015), Colombia (Puerta, 2015), Moldova and Georgia (Vanore, 2015), Romania (Botezat & Pfeiffer, 2014), Pakistan (Iqbal et al.; 2014), Indonesia, the Philippines, and Vietnam (Graham & Jordan, 2011). Most of the studies have been conducted in China. This geographical diversity allowed the researchers to examine the effects of parental absence in both Asian and non-Asian contexts, encompassing a wide range of economic and sociocultural factors. The primary research focus across these diverse locations revolved around three main dimensions: health and nutritional status, mental and emotional well-being, and academic achievement and performance among LBC.

There has been a growing interest in understanding the multidimensional effects of parental migration on LBC, and these studies contribute significantly to this field. For instance, Islam et al. (2019) explored into the nutritional disorders of LBC in Bangladesh, highlighting the importance of addressing their physical health. Luo et al. (2019) explored emotional and behavioral problems among LBC in China, emphasizing the need for psychological support.

Tang et al. (2019) and Wang et al. (2019) examined the physical and mental well-being of LBC in China, respectively, shedding lights on the complex interplay of the factors affecting their health. Adhikari, (2019) focused on LBC in Nepal, and their education, health, and psychosocial development.

The impact of parental absence on academic performance is a recurring theme in several studies, including Bai et al. (2018) in China, Odoh, et.al. (2018) in Nigeria, and Walter (2018) in Kenya. Academic achievement and performance were a central focus, with ST and academic assessments used to evaluate LBC's educational outcomes (Adhikari, 2019; Odoh et al., 2018 ; Walter, 2018). Health and nutritional status were assessed using AM such as height-for-age, weight-for-height, and weight-for-age (Mo et al., 2016). These measurements provided valuable data on the physical well-being of LBC, helping researchers understand the impact of parental absence on their overall health. Mental and emotional well-being were examined through various tools and questionnaires, including the SDQ (Luo et al., 2019) and SRQ (Wang et al., 2019). These assessments allowed researchers to explore the psychological challenges and emotional experiences of LBC in different cultural contexts.

Result found how parental absence may affect LBC's academic progress and success in school. In addition to these primary dimensions, some studies explored the related factors such as the impact of parental migration on education and health, parenting patterns in the absence of parents, and the prevalence of cigarette smoking among rural adolescents (Luo et al., 2019). Studies underscore the importance of educational interventions and support for ensuring the academic success of LBC (Sharma, 2023). Additionally, the psychological well-being of LBC is examined in various contexts. Jampaklay et al. (2018) in Thailand assess the impact of parental absence on childhood development, while Liu et al. (2018) in China investigate differences in the theory of mind between LBC and Non-Left-behind Children (NLBC). Furthermore, studies such as Mazzucato et al. (2015) in Ghana, Nigeria, and Angola, and Graham & Jordan (2011) in Indonesia, the Philippines, Thailand, and Vietnam, explore the psychological well-being of LBC in different cultural settings.

It highlights the global nature of the issue of LBC, with researchers examining their well-being, health, education, and psychological development in diverse contexts. These studies collectively contribute to our understanding of the challenges faced by LBC and provide valuable insights for policymakers and practitioners working to improve their lives. Each study was tailored to the specific research objectives and context of the location, highlighting the multidimensional nature of the impact of parental absence on LBC. The diverse geographical settings and research focus areas contributed to a comprehensive understanding of this complex phenomenon. The selected studies covered a wide range of countries and research focus areas, allowing for a comprehensive exploration of how parental absence impacts the well-being and academic performance of LBC in different cultural and socioeconomic contexts. These studies collectively contributed to a nuanced understanding of the challenges and opportunities faced by LBC around the world.

**Research Design**

Cross-sectional study designs emerged as the most prevalent research method among the selected studies. Cross-sectional research provides a snapshot of data at a specific point in time and is particularly suited for exploring relationships between variables within a population. It allows for the collection of data from individuals of various age groups, backgrounds, and experiences, thus offering a comprehensive perspective on the effects of parental absence. These cross-sectional studies aimed to investigate the impact of parental absence on children's physical and mental health, often using SAQ and quota sampling methods for data collection. For instance, Tang et al. (2019) employed a cross-sectional design to examine the prevalence of cigarette smoking tendencies among rural adolescents in South China, gathering data through SAQ. Gao et al. (2010) utilized a similar approach to assess self-efficacy levels, while Wang et al. (2019) used SRQ to gauge the mental health status of LBC in rural China. Additionally, a non-experimental correlational study with a cross-sectional design was used to explore the relationship between cognitive processes and academic performance in high school students.

Jia &Tian (2010) conducted a community-based cross-sectional study in rural China on the loneliness of LBC, distributing SSQ to both LBC and NLBC. The study also included cross-sectional surveys to assess physical health and parenting patterns through interviews and AM. Similarly, in China, a study was conducted among children aged 6 to 12 living with their grandparents and parents, using cluster sampling methods and assessing respondents through questionnaires and AM (Nanthamongkolchai et al., 2011). Another cross-sectional study focused on the impact of parental migration on the health status of LBC in China, collecting data on health behaviors, parental migration, and demographic characteristics through SAQ and measuring overweight/obesity and stunting through AM (Islam et al. 2019; Gao et al. 2010).

Beyond cross-sectional designs, some studies employed longitudinal designs to track the changes in LBC's well-being and academic performance over time. Longitudinal research is valuable for identifying the trends and patterns that may not appear in cross-sectional studies. For instance, Jampaklay et al. (2018) utilized a longitudinal study and mixed methods study design to assess the impact of parental absence on early childhood in Thailand, conducting IDI and applying the DDST to assess overall development. A collaborative longitudinal survey examined the effects of PIM on education and health of LBC, employing multistage and random clustered sampling strategies and utilizing questionnaires to measure child personal values (Liu et al., 2018). In addition to cross-sectional and longitudinal designs, case studies were also incorporated to provide an in-depth exploration of specific situations, offering distinct insights into the lives of LBC. A case study in China used the SWLS to measure satisfaction levels among children and ST scores to assess academic achievement (Song et al., 2018). Causal-comparative research designs were also employed to understand the causal relationship between parental absence and various outcomes by comparing LBC with NLBC to identify the differences in health, well-being, and academic performance (Walter, 2018). Moreover, survey designs played a significant role in data collection, enabling researchers to efficiently gather the information from a diverse range of participants, often using SAQ. These surveys, when

combined with other research methods, contributed to a comprehensive understanding of LBC's lives (Luo et al., 2019).

These studies employed a mix of research methods, with cross-sectional study designs being predominant. Additionally, some studies used longitudinal, case, causal-comparative, and survey designs. These diverse research designs were strategically chosen to address the complex research questions related to parental absence and its impact on the health, well-being and academic performance of LBC.

**Sample and Sampling Methods**

To explore the comprehensive insights into this multifaceted phenomenon, it has employed diverse sampling methods. These methods have been chosen to align with specific research methods used, available resources, and the contexts in which they are applied. One of the fundamental decisions made by the researchers in their studies was to focus on school-age children. By narrowing their investigation to this demographic group, researchers could effectively compare and contrast the experiences of LBC and NLBC. This approach was inherently logical, as it allowed for a deeper understanding of the differences between children who encountered parental absence and those who did not. The result was a more nuanced exploration of the complex dynamics that shape the lives of these children. However, a critical aspect of any study is the selection of study participants. Researchers recognized that the diversity of experiences among LBC and NLBC across different countries required equally diverse sampling methods. They understood that the methods chosen should harmonize with the unique research objectives and practical constraints of each study.

One commonly employed method was probability proportional sampling (Islam et al., 2019). This technique ensured that each potential participant had an equal chance of being selected, thereby enhancing the representativeness of the sample. It offered a structured approach that minimized the potential for bias and allowed for a more comprehensive understanding of the broader population. Another approach, systematic sampling, involved selecting every nth participant (Islam et al., 2019). This method, while simplifying the data collection process, retained a level of randomness, making it a valuable tool in many studies. Random sampling, a cornerstone of research, was also utilized (Luo et al., 2019). Its primary purpose was to minimize bias and ensure that every prospective participant had an equal opportunity to be included in the study.

In the cases where research spanned different regions or administrative divisions, multi-stage sampling proved invaluable (Tang et al., 2019). This method allowed researchers to capture a diverse range of experiences among LBC. By breaking down the sampling process into stages, they could access a broader spectrum of perspectives, enriching their findings. However, researchers also recognized the importance of delving deeper into specific aspects of LBC's lives. This led to the strategic use of purposive sampling, which targeted specific groups of LBC or NLBC (Adhikari, 2019). This approach provided a more profound understanding of some particular aspects of their experiences. Similarly, stratified sampling, involving the division of the population into subgroups and random selection from each subgroup, ensured that different demographic groups were accurately represented in the sample (Walter, 2018).

Some studies turned to cluster sampling when participants were located in close proximity to each other. This method streamlined the process of data collection by selecting the groups of participants clustered together (Mo et al., 2016 ; Nanthamongkolchai et al. 2011s). It proved to be a practical choice under certain circumstances. Convenient sampling played a role when practical considerations came into play (Iqbal et al., 2014). This approach allowed researchers to select participants who were readily available for the study, making it a suitable choice in situations where logistical constraints were significant. In striving for balanced representation, researchers turned to quota sampling. This method involved selecting participants based on the predetermined quotas for various demographic factors (Adhikari, 2012). By ensuring a proportional representation of different demographic groups, researchers could explore the impact of parental absence across a diverse spectrum of backgrounds. The strategic selection of these diverse sampling methods was driven by the overarching goal of aligning with research objectives and practical constraints. They collectively allowed researchers to capture an extensive range of perspectives and experiences among LBC and NLBC.

Sampling methods helps to explore the specific research designs and data collection tools. Understanding how data were gathered provides further insight into the depth of the research conducted in this field. In a quantitative design, surveys served as the primary research method (Adhikari, 2012; Vanore, 2015). Researchers harnessed the power of surveys by employing five-point Likert scale of survey questionnaires. This approach allowed for the collection of structured data in a systematic and standardized manner. An example is a survey conducted in the Chitwan district of Nepal, where respondents were selected through a random sampling method to uncover the consequences of mother migration (Adhikari ; 2019). Conversely, purposive sampling method was deployed to investigate the effects of rural-urban migration on LBC in the Ningo-Prampram district of Ghana (Appianing, 2013). This study utilized close-ended SQ for data collection, but it also integrated open-ended questions to capture additional information. Similar demand in data collection methods were evident in the study exploring the impacts of labor migration on LBC, particularly in elementary schools in the Philippines (Graham & Jordan, 2011). Here, researchers relied on questionnaires for children and conducted SSI with parents (Fu et al., 2017). In the context of China, a study examining the effect of PIM adopted a more comprehensive approach, utilizing interviews and semi-structured questionnaires (Beh, 2017).

Qualitative approach emerged in a study conducted in the Punjab province of Pakistan (Iqbal et al., 2014). This research delved into the impact of international male migration on the education of LBC through IDI. The researchers implemented purposive and convenient sampling techniques to select their respondents (Iqbal et al., 2014). This qualitative perspective provided valuable insights into the lived experiences of LBC affected by international male migration. In rural China, researchers conducted a comparative study on the social cognitive domain coordination of LBC and NLBC. The study adopted a semi-structured interview format. All interviews were conducted in independent rooms within local schools, ensuring a conducive environment for participants. These interviews lasted approximately 30 minutes each (Lu et al.,

2016). Furthermore, the study on theory of mind development in LBC utilized a multifaceted approach. Its integrated tasks such as the strange stories task, a second-order false belief task etc. to assess children's mind development. Additionally, sessions B and C in Raven's Standard Progressive Matrices were employed to evaluate children's general reasoning abilities (Liu et al., 2018). In this study, surveys were conducted using questionnaires meticulously designed to extract as much information as possible (Adhikari, 2012). These approaches allowed researchers to gauge the multifaceted influence of remittances on the education of LBC. Similarly, descriptive survey design emerged as a prevalent method to assess the impact of parental occupation and education on LBC. Structured questionnaires were the chosen tools for data collection in these studies (Fu et al., 2017). A study conducted in Nigeria aimed to explore the academic performance of students, employing a survey design. Students and academic sessions were randomly selected, enhancing the representativeness of the sample.

Romania ventured into assessing the impact of PIM on the academic achievement of LBC by utilizing GPA from the last semester as a key metric (Botezat & Pfeiffer, 2014). Meanwhile, in Northwestern China, standardized examinations were leveraged to scrutinize the effect of PIM on the academic performance of LBC. This rigorous approach employed standardized tests to assess the academic achievement of LBC. Demographic information, including age, grade, sex, socio-economic status and sibling status, was collected through questionnaires (Fu et al., 2017). Parental involvement in children's education became a focal point in a study conducted by Botezat & Pfeiffer (2014). This research aimed to unravel the effect of parental roles on the educational achievement of children. The study administered a Likert-type scale and utilized GPA as a measure of academic achievement. Nigeria reappeared on the research landscape with a descriptive survey designed to examine the influence of parental occupation and parental level of education on students' academic performance. In this study, purposive sampling was again employed to select students. SQ served as the primary tools for data collection (Walter, 2018). These diverse research designs and data collection tools illustrate the multidimensional nature of studies related to parental absence and its impact on LBC. Researchers recognized that the complexity of this phenomenon required a multifaceted approach to data collection, blending quantitative and qualitative methods tailored to specific research objectives.

This comprehensive analysis of samples and sampling methods within the context of studies on PIM and its impact among LBC and NLBC underscores the meticulous and thoughtful approaches adopted by researchers. They acknowledged the diverse experiences of these children across various cultural, geographical, and socioeconomic contexts. The selection of appropriate sampling methods has been instrumental in advancing our understanding of the intricate challenges and consequences faced by LBC.

**Research Tools**

When it comes to studying LBC, the choice of research tools/instruments takes on heightened importance, given the intricate nature of the subject matter. Researchers must select the tools that not only align with their research objectives but also resonate with the unique experiences and challenges faced by LBC. This comprehensive analysis explores the pivotal

role of research tools in this context. Several assessment tools have been judiciously employed to gather data about LBC's emotional well-being, behavioral patterns, academic performance, and overall health. These tools encompass a range of questionnaires, interviews, tests, and measurements. Each instrument has been thoughtfully chosen to address specific aspects of LBC's lives and experiences.

One prominent tool in assessing the emotional and behavioral aspects of LBC is the SDQ (Luo et al., 2019). SDQ stands out as a comprehensive assessment tool that encompasses five key factors: emotional symptoms, hyperactivity, problems with conduct, peer problems, and pro-social behaviors. It provides a standardized framework to gauge the psychological well-being of LBC (Adhikari, 2012). To delve into the mental health status of primary caregivers, the SRQ was employed (Wang et al., 2019). SRQ serves as a valuable tool to assess the psychological well-being of caregivers and, by extension, its impact on LBC (Adhikari et al., 2014). Moreover, questionnaires have been used to gauge the physical health of children, encompassing the issues such as colds, coughs, fever, flu, headaches, stomachaches, diarrhea, and eye problems (Adhikari, 2012). These questionnaires provide insights into the physical well-being of LBC.

AM have been instrumental in assessing the nutritional status of LBC (Lu et al., 2016). These measurements, including height-for-age, weight-for-height, and weight-for-age, offer an objective assessment of nutritional health (Adhikari, 2012) (Adhikari, 2012). By employing AM, researchers can discern patterns and variations in nutritional status among LBC. In the context of Moldova, a household survey was conducted to evaluate the impact of migration on LBC. This survey included the SDQ, a behavioral screening instrument comprising 25 questions which were designed to identify the potential cases of mental health disorders among children aged 5-17 (Vanore, 2015). The SDQ provided valuable insights into the emotional well-being of LBC in Moldova.

Face-to-face questionnaires were administered to collect general demographic data of LBC and their caregivers in China. Additionally, the SDQ was employed to assess children's emotional and behavioral problems (Luo et al., 2019). This method ensured that a diverse range of LBC was included in the study, allowing for a more comprehensive understanding of their experiences. Similarly, in various regions, including Ghana, Nigeria, Angola, and Southeast Asia, the SDQ has been utilized to examine the differences among children under 12 years concerning the psychological well-being of LBC (Graham & Jordan, 2011; Mazzucato et al., 2015). Beyond questionnaires, SSQ have been deployed to gather detailed information from participants (Vanore, 2015). These questionnaires enable a more in-depth exploration of their experiences and perspectives, offering qualitative data that complements the quantitative findings of LBC (Wang et al., 2019). The assessment of academic achievement among LBC has been facilitated by ST (Bai et al., 2018). These tests provide a reliable and objective measure of their performance in various subjects. Researchers have relied on ST to evaluate the impact of parental absence on educational outcomes, providing valuable insights into the academic challenges faced by LBC.

The SRQ have been instrumental in assessing the mental health status of LBC across different settings (Wang et al., 2019) . These questionnaires allow participants to self-report their mental well-being, providing insights into the emotional challenges they may encounter. They serve as a direct window into the subjective experiences of LBC. SSI have been invaluable in capturing the qualitative dimensions of LBC's experiences (Adhikari, 2019). These interviews provide a platform for open-ended discussions, allowing for a deep exploration of the participants' perspectives. Researchers have leveraged SSI to gain rich qualitative data that complements the quantitative aspects of their studies. SQ have played a key role in systematically collecting data on various aspects of LBC's lives, including personal and family information (Appianing, 2013). SQs are versatile tools that have been employed in various studies to gather demographic information, health behaviors, and insights into the experiences of LBC.

The DDST has been a valuable instrument for assessing the overall development of LBC, providing insights into their physical and cognitive development (Jampaklay et al., 2018). This tool offers a standardized approach to evaluating developmental milestones. IDI have offered a qualitative method for gathering rich, context-specific information from parents and caretakers about the impact of parental absence on early childhood (Iqbal et al., 2014). These interviews have provided a deeper understanding of the lived experiences of LBC and their families.

The SWLS has been utilized to measure the life satisfaction levels among children, offering a subjective assessment of their overall well-being (Song et al., 2018). It provides insights into the emotional and psychological dimensions of LBC's lives. It explores their personal values and motivation, shedding light on the factors that drive their academic and personal development. Survey questionnaires have emerged as versatile tools for collecting data efficiently and systematically (Adhikari, 2019). They have been employed in various studies to gather information on demographic factors, health behaviors, and the impact of parental migration. It provides researchers with a structured framework for data collection (Appianing, 2013). The SST and neuropsychological batteries have been used to assess cognitive development and cognitive skills among LBC (Puerta, 2015). These tools offer insights into LBC's academic readiness and cognitive abilities, shedding light on their cognitive development.

The limitations of the reviewed studies on LBC include reliance on cross-sectional designs, inconsistent sample sizes, and geographical overrepresentation of Asian countries, restricting the global applicability of findings. Future research should emphasize longitudinal studies to track changes over time, expansion to more diverse regions, and explorations on the under-researched topics such as long-term career outcomes and social integration. Additionally, incorporating mixed-method approaches, gender-specific analyses, and policy evaluations would provide deeper insights and guide effective interventions for improving the overall well-being and academic performance of LBC.

## Conclusion

Analyzing the research papers of different countries, it is concluded that cross-sectional study designs have been adopted more commonly than the longitudinal studies. Similarly, as the research tools, ID, likert scale, structured and SSQ have been applied to find out the effects of PIM on health and academic performance of LBC. SRQ, SDQ, SAQ, ST, DDST are some of the more common tools to assess the effect of parental absence on children's physical and mental health. Similarly, AM has been widely used to examine the nutritional status of children while GPA is more common to assess the academic performance. Regarding the selection of the respondents, purposive sampling, quota sampling, random sampling and stratified sampling have been commonly practiced. The choice of research tools and instruments in the study of LBC is not a one-size-fits-all decision. Each tool brings unique strengths and considerations to the research process. ST provides reliable data but may miss cultural nuances, while SQ offers efficiency but requires careful design for cultural and age appropriateness. AM objectively assess physical health, and qualitative interviews allow for the exploration of emotional and social dimensions. Researchers must carefully select and combine these tools to ensure the understanding of the multifaceted well-being and development of LBC.

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## Conflict of Interest

There are no conflicts of interest in this study.

## Authors' Contribution

Sushil Sharma: Study conception, methodological design, reviewed the literature, analysis and interpretation of data, preparation of the manuscript, finalization of the manuscript

Prof. Bhimsen Devkota, PhD: Study conception and design, supervision, review the manuscript critically, approved the final version of the manuscript

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