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Study in the East Khasi Hills District of Meghalaya

Assessment of Health Hygiene and Sanitation Status of the Khasi in North East India, with Special Reference to Women and Children

Regional Project

On

"Assessment of Health Hygiene and Sanitation Status of the Khasi in North East India, with Special Reference to Women and Children"

Study in the

East Khasi Hills District of Meghalaya (FY 2024-2025)

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INTRODUCTION

A vital indicator of a healthy society is the well-being of both mothers and their children. The health of a mother directly influences the health and survival of her baby, making maternal and child health a central focus in public health discourse. Pregnancy and childbirth are transformative phases in a woman's life, often accompanied by profound emotional, psychological, and physiological changes. These events not only bring moments of great hope and joyful anticipation but also present challenges that require adequate healthcare, nutrition, and social support (Nagral, 1997).Globally, the reproductive health of women remains a critical concern. According to estimates, in 2011, approximately 1.5 billion women were within the reproductive age group of 15 to 45 years. Notably, India accounted for a substantial share of this demographic, comprising about 26 percent (310.62 million) of the global population of women of childbearing age (WHO, 2023). This significant proportion underscores the importance of addressing maternal health issues within the Indian context, as interventions targeted at this group have the potential to produce large-scale improvements in public health outcomes.

Maternal and infant mortalities pose substantial challenges to global public health. The world suffers from an unexpectedly high burden of maternal mortality, with an overall estimated Maternal Mortality Ratio (MMR) of 223 maternal deaths per 100 000 live births in the year 2020 (World Health Organization [WHO], 2023). Central and Southern Asia is one of the biggest contributors to global maternal mortality with an MMR of approximately 129 (WHO, 2023). In 2020, India recorded the second-highest number of global maternal deaths, with approximately 24,000 fatalities, ranking just below Nigeria (WHO, 2023). Similarly, India also has one of the highest global Infant Mortality Ratios (IMR) standing at 40.7 deaths per 1000 live births (Ministry of Tribal Affairs, 2023). Maternal and child health and nutrition (MCHN) indicators reflect a country's ability to meet the Sustainable Development Goals (SGDs 1).While many LMICs are struggling in achieving SDG MCHN related targets, relatively a few countries hasbeen able to do so over the years. While many low- and middle-income countries (LMICs) are struggling to achieve the sustainable development goals (SDG) targets, India stands as a unique nation which has had consistently improved maternal and child health and nutrition (MCHN) however maternal and infant mortalities poses substantial challenges to global public health despite the effort. Acute morbidities affect over 50 million pregnancies and deliveries each year. Poor health care practices during pregnancy, childbirth and after delivery are responsiblefactors for maternal and infant morbidity and mortality. The leading causes of deaths and deformity for women of reproductive age in developing countries are found to be due to obstetric complications which is the world's most urgent and intractable health problems (Singh. *et.al.* 2004).

In India tribal communities bear a significant burden with over 50% of all maternal deaths and IMR in the country (Madankar et al. 2024). The IMR among tribal children is 30% higher than the national average and 61% higher for tribal children under five (Madankar *et al*. 2024). The higher IMR and MMR observed in tribal populations according to Madankar et al. (2024) is due to disparities in social determinants of health such as education, adequate and trained healthcare workforce, access to care, and health financing. Inadequate healthcare infrastructure, limited access to essential services, malnutrition, and high disease prevalence, hinder overall health and well-being of tribal populations in India (Hamal *et. al*. 2020). With low socioeconomic status, and remote rural area adds to disease burden posing a challenge for maternal and child health care among tribal populations. This includes communicable and non-communicable diseases, malnutrition, mental health issues, and addictions which are all related to inadequate health care and healthcare infrastructure (Kumar *et. al*., 2020).To illustrate, maternal and child healthcare services are mostly underutilized amongst tribal women, with only 10 % of tribal women receiving full antenatal care and only 18% of tribal women having institutional deliveries (Madankar *et.al*. 2024). Tribal children were found to have a full vaccination rate of only 55.8%, whereas the national average stood at 62.0% (Ministry of Tribal Affairs, 2019). The elevated IMR in tribal communities can be partially attributed to the lower vaccination rates. The presence of unfavorable social indicators in tribal populations is the result of long-standing discrimination and an infringement of rights of tribal communities. Additionally, social and geographic isolation restrain maternal and infant health in tribal communities (Hamal *et. al*., 2020). Furthermore, almost 90% of tribal people reside in rural areas (The Expert Committee on Tribal Health, 2023). Rural areas in India are characterized by numerous healthcare challenges, including limited access to quality healthcare facilities, subparquality of primary health care, and ineffective training of rural healthcare professionals (Mohan & Kumar, 2019; Sabri *et. al*., 2023).

Malnutrition among children is also a major global public health problem. It is the major underlying cause for about 50 percent deaths among children. The Indian Health of Nation's State report (2017) highlighted that in the North-East State of India, the Malnutrition is more severe in comparison to the national average (Suri, 2023), particularly Assam and Meghalaya, which are still considered at the lowest level of epidemiological transition. Meghalaya has the highest stunting at 47%, followed by Nagaland at 32.7%, Tripura at 32.3%, and Mizoram at 28.9% (Suri, 2023). The widespread occurrence of undernutrition poses a significant public health challenge for children in most of the developing nations. Globally, one in three children under the age of five experiencing under nutrition expressed as stunting (low height for age) or wasting (low weight for height) or underweight (low weight for age) and in certain instances overweight/obesity (Permatasari and Chadirin 2022). In a recent report, United Nations Children's Fund (UNICEF) revealed that approximately 22.3% (148.1 million) under-five children were stunted, 6.8% (45 million) were wasted, and 5.6% (37 million) were overweight (Krishna and Srijayanth 2022; UNICEF 2023). On the other hand, 462 million children of that age were underweight, globally (Krishna and Srijayanth 2022; UNICEF 2023). India has notably reported the highest rates of childhood malnutrition on a global scale (Krishna and Srijayanth

2022; Biswas and Khatun 2023). India's ranking in the Global Hunger Index 2023 is 111 (slipped from the 2022 index of 107) out of 125 countries. The Hunger Index measures countries performance on four component indicators – undernourishment, child wasting, child stunting and child mortality. The recent National Family Health Survey–5 (2019-21) data revealed the prevalence of stunting, wasting and underweight for under-five children in India is 35.5%, 19.3% and 32.1%, respectively (International Institute for Population Sciences (IIPS) 2021). This signifies a very alarming condition as the frequency of stunting and wasting in under-five Indian children was much higher when compared with global data. Nutritional status for the state of Meghalaya, revealed high rates of childhood under nutrition with 31% underweight, 42% stunting, 17% wasting, and 71% of children under 5 with anaemia (District Level Health Survey of the International Institute for Population Sciences, 2014). A study conducted in 2022 (Sample Registration System Bulletin of Registrar General of India, 2022) showed that Assam has the highest infant mortality rate (IMR) followed by Meghalaya and Arunachal Pradesh, which is the cause of significant concern. Mizoram has shown comparatively better performance in regards to child mortality rate and health.

Another major public-health concern is childhood anaemia with an increasing risk of mortality. The NFHS data showed that in North East India 52.5% of children were anaemic (1.9% severely anaemic, 24.7% moderately anaemic, and 25.9% mildly anaemic) including highest proportion of anaemic children in Tripura (74.2%), followed by Assam (61.8%). On the other hand from 2015-2022 in Arunachal Pradesh, a declinetrend in the prevalence in anemia among women aged 15-49 years was observed and the reduction was noteworthy. In contrast, in Meghalaya the prevalence of anemia increased from 27.9% (NFHS 4, 2015-16) to 28.9% (NFHS 5, 2019-21). To address these challenges, it's crucial to develop targeted interventions that consider the ethnic specific needs, cultural sensitivities, and relationship between social, cultural, economic and geographical context in a distinctive community with special emphasis on maternal nutrition and child health outcome.

Additionally, sanitation and hygiene play pivotal roles in public health strategies, preventing diseases and enhancing overall quality of life. Despite their importance, there has been a historical lack of adequate hygienic facilities in India. In the context of North East India, various geographical, cultural, and developmental factors contribute to sanitation and hygiene. Efforts are made to improve sanitation and hygiene among the people however improving public health and well-being are not exempted from facing challenges.

It is found that mortality and morbidity data are essential in understanding the health status of populations, evaluating healthcare interventions effectiveness, and identifying areas requiring attention in public health strategies. Therefore, the purpose of this qualitative study is to identify morbidity and mortality of the community with special reference to the health of women and children, community involvement in health care, community and personal hygiene along with anthropometric measurement of mother and child. With persistence of child and maternal

malnutrition in North East India, notably in Meghalaya despite the Government efforts this project aims to measure nutritional status, hygiene, and sanitation among women and children in the State of Meghalaya. The goal is to develop a comprehensive model tailored to intervene the problems while understanding the factors such as social-cultural and geographical barriers, and diverse ethnic groups as these factors play a crucial role in shaping maternal and child health.

To the best of current knowledge, there exists a significant scarcity of comprehensive data concerning the health, hygiene, and sanitation status of tribal communities in North East India. While national-level surveys and health reports provide broad overviews, they often fail to capture the nuanced realities of these indigenous populations, particularly when it comes to disaggregated data specific to ethnicity, geography, and socio-cultural contexts. More importantly, there is a notable lack of integrated or triangulated analyses that examine the interrelationship between health outcomes and other influencing variables such as socio-economic status, environmental conditions, education levels, and access to public services. This gap is especially critical in a region as diverse and ecologically sensitive as the North East, where community-specific challenges and structural inequities can significantly affect health behaviours and outcomes.

Recognizing this data gap, the present study has made a concerted effort to bridge the disconnect between available secondary information and the ground-level realities faced by tribal populations of North east India. By adopting a holistic and interdisciplinary approach, the study attempts to triangulate health data with relevant socio-economic, cultural, and environmental factors, thereby providing a more grounded and context-sensitive understanding of health and sanitation issues. This approach not only enhances the accuracy of the findings but also contributes valuable insights for policy formulation, program design, and targeted interventions aimed at improving public health outcomes among these often-overlooked communities. Against this backdrop, the primary objectives of the study are as follows:

1. Undertake a survey of the morbidity and mortality of the community with special reference to the health of women and children.

2. Assess the anthropometric parameters of the children and mothers of the Khasi community.

3. Undertake the existing facilities and practices for community and personal hygiene to know the role of cultural, social, economic and other factors in the hygiene behaviour of Khasi women and children.

4. Identify the extent of community involvement in the health care and also the factors that promote and inhibit community involvement.

MATERIALS AND METHODS

The present study isa part of the regional project of Anthropological Survey of India, North East Regional Centre entitled "**Assessment of Health Hygiene and Sanitation Status of the Khasi in North East India, with Special Reference to Women and Children**".

The study was conducted among the mothers of age group 17 - 49 years and children of the age group 0-5 years respectively. During the present fieldwork, total 353 mothers, 183 and 170 motherswere studied from Mawpat and Mawsynram block respectively and total 330 children, 156 from Mawpat block and 174 from Mawsynram block were studied.

Area of Study

Two blocks, Mawpat and Mawsynram of East Khasi Hills district was taken as the area of study during the survey based on their proximity to the district headquarter. Block Mawpat is nearer to the district headquarter with 25.59° North (latitude) and 91.92° East (longitude) whereas, block Mawsynram is farther from the district headquarter with 25.29° North (latitude) and 91.58° East (longitude).

Altogether 301 households, 150 households from Mawpat block where 5 villages were studied and 151 households from Mawsynram block where 10 villages were studied respectively. The survey was systematically conducted with the help of structured and pre - tested scheduletocomprehensively understand the health status of women and children in terms of mortality, morbidity and nutritional status by examining the relationship between the socio-cultural and geographical factors. Fieldwork was conducted in two phases, the duration of first phase was from February, 2024 March, 2024 and the block Mawpat was covered during this time. The second phase was from July, 2024 to August, 2024 during with the block Mawsynram was covered.

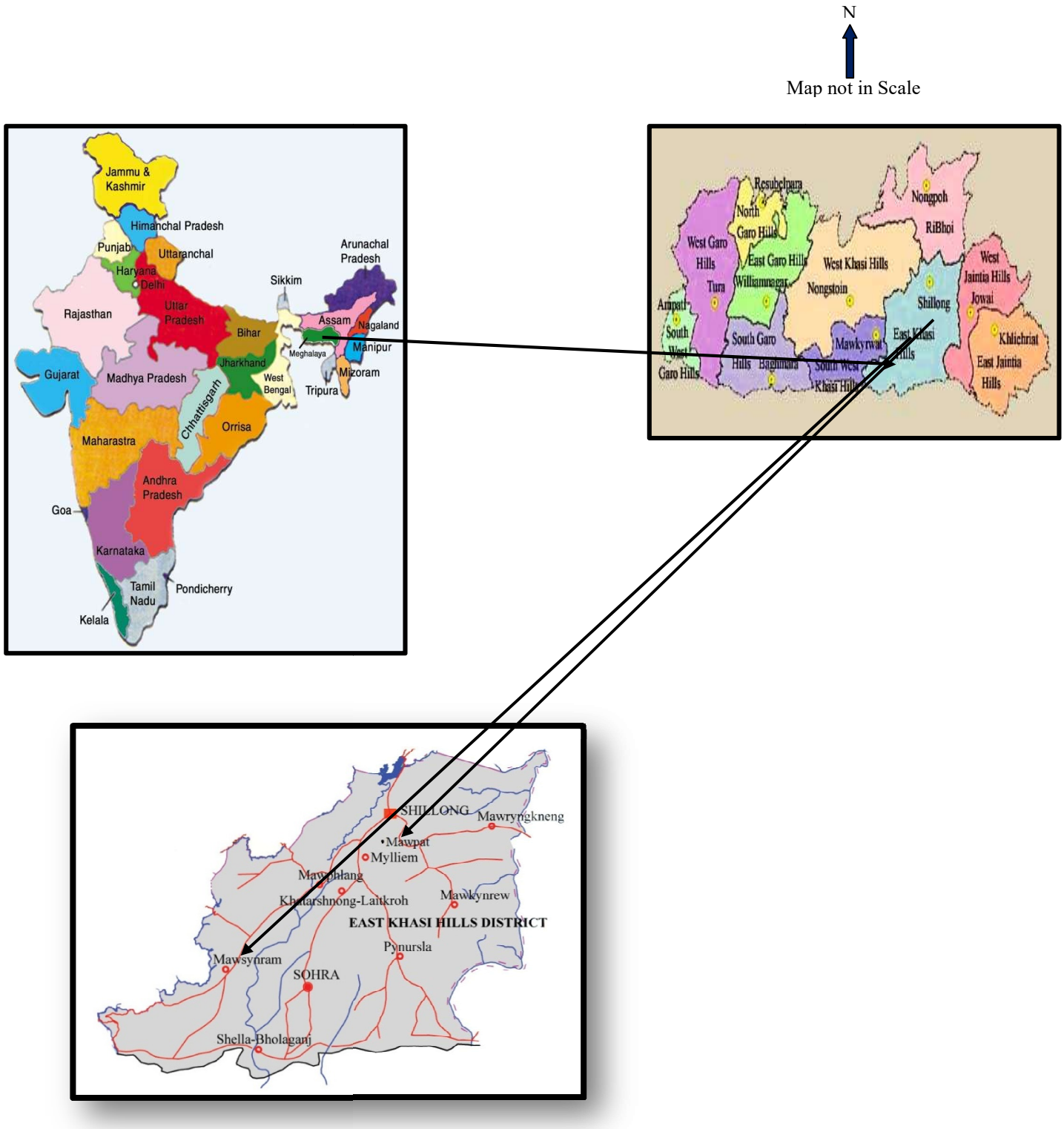


Fig. 1 Maps depicting the State of Meghalaya East Khasi Hills District with its two blocks Mawpat and Mawsynram

Studied Population

The present cross-sectional study was conducted among the Khasi tribal community of East Khasi Hills Districts of Meghalaya. The Khasi is the largest group in Meghalaya. The Khasi is distributed in central Meghalaya. The tribe Khasi is sub-divided into seven sub-groups, namely - Khynriam, Pnar or Synteng, Bhoi, War (sub-divided into War-Jaintia and War-Khynriam), Maram, Lyngngam and Diko (Gopalakrishnan, 1995). They belong to the Indo-Mongoloid racial stock (Mukherjee and Khongsdier, 2003) and are linguistically placed under the Austro-Asiatic groups as belonging to a sub-group known as the Mon-Khmer (Nagaraja, 2000).

Studied Villages

The selection of studied villages prioritized areas with a **predominantly Khasi population**, ensuring cultural homogeneity within the primary study group. Within **Mawpat** block, five key villages were chosen for investigation: Mawdiangdiang, Mawlong, Lapalang, Mawkasiang and Nongrah, covered under Rynjah Primary Health Centre. This selection aimed to provide a representative sample of villages within the block. In **Mawsynram** block, ten key villages were chosen for investigation: Dongneng, Lawbah, dongrum, Nongtrai, Mawlyngbna, Ladkrem, Pongkung, Dangar Dombah, Dangar and Pyndendakni. Villages such asDongneng,Dongrum, Lawbah, Nongtrai, Mawlyngbna, Ladkrem and Pongkungare under Lawbah Primary Health Centre while villages such as Dangar, Dangar Dombah and Pyndendakni are under Dangar Primary Health Centre.

Studied Participants

A total of 301 households were covered from Mawpat and Mawsynram block, selected through systematic random sampling with the aim to study Khasi mothers of 17-49 years and children of 0-5 years. Out of these 301 households, only 301 women and 287 children were considered for the present studybasedon their availability.

Table 1: Village wise distribution of the selected Households and total Women-child population

Blocks	Villages	Total Households	No. of Women (17-49 years)	No. of Children (0-5 years)
Mawpat	Mawdiangdiang	12 (3.98%)	16 (4.53%)	17 (5.15%)
	Mawlong	25 (8.30%)	25 (7.08%)	25 (7.58%)
	Lapalang	40 (13.28%)	57 (16.15%)	35 (10.61%)
	Mawkasiang	28 (9.30%)	33 (9.35%)	36 (10.91%)
	Nongrah	45 (14.95%)	52 (14.73%)	43 (13.03%)
Mawsynram	Dongneng	11 (3.65%)	19 (5.38%)	12 (3.64%)
	Lawbah	26 (8.63%)	15 (4.25%)	36 (10.91%)
	Dongrum	10 (3.32%)	10 (2.83%)	10 (3.03%)
	Nongtrai	16 (5.31%)	18 (5.10%)	25 (7.58%)
	Mawlyngbna	9 (2.99%)	12 (3.40%)	10 (3.03%)
	Ladkrem	5 (1.66%)	6 (1.70%)	5 (1.52%)
	Pongkung	22 (7.30%)	29 (8.22%)	24 (7.27%)
	Dangar Dombah	7 (2.32%)	13 (3.68%)	3 (0.91%)
	Dangar	30 (9.96%)	31 (8.78%)	33 (10%)
	Pyndendakani	15 (4.98%)	17 (4.82%)	16 (4.85%)
Total		301 (100%)	353 (100%)	330 (100%)

A total of 150 households from Mawpat Block, comprising women aged 17–49 years, were surveyed. These households included 183 women and 156 children aged 0–5 years. Similarly, in Mawsynram Block, 151 households were surveyed, which included 170 Khasi women and 174 Khasi children. Thus, across both blocks, the household survey registered a total of 353 women and 330 children.

Of the 353 women, 183 (51.84%) were from Mawpat, and 170 (48.19%) were from Mawsynram. Amongthe 330 children, 156 (47.27%) were from Mawpat and 174 (52.73%) from Mawsynram.

Within Mawpatblock, the highest proportion of surveyed households (14.95%) was from Nongrah village, followed by Lapalang. The maximum number of women (17–49 years) were recorded in Lapalang (16.15%), followed by Nongrah (14.73%). Regarding children aged 0–5 years, the highest number was also reported from Nongrah (13.03%). Additionally, four villages—Mawkasiang (Mawpat), Dangar (Mawsynram), Lapalang (Mawpat), and Lawbah (Mawsynram)—each contributed a moderate number of children, ranging between 10% and 10.91%.

Table 2: Age Group Wise Distribution of Studied Mothers of Mawpat and Mawsynram Block of East Khasi Hills

Age group (in years)	Mawpat	Mawsynram	East Khasi Hills (Total)
17 – 27	46 (15.28%)	43 (14.29%)	89 (29.57%)
28 – 38	77 (25.58%)	88 (29.24%)	165 (54.82%)
39 – 49	27 (8.97%)	20 (6.64%)	47 (15.61%)
Total	150 (49.83%)	151 (50.17%)	301 (100%)

The age-group-wise distribution of mothers studied from Mawpat and Mawsynram blocks of East Khasi Hills district reveals significant demographic patterns. Out of the total eligible women, 301 mothers were considered for detailed analysis based on their availability during the survey period. This corresponds to an availability rate of approximately 80%, indicating a reasonably high response and participation level. The 301 participating mothers were categorized into three distinct age groups: 17–27 years, 28–38 years, and 39–49 years. Among these, the highest representation was observed in the 28–38 years age group, which accounted for 54.82% of the total respondents.

Table 3: Age Group Wise Distribution of Studied Children of Mawpat and Mawsynram Block of East Khasi Hills

Age group (in months)	Mawpat		Mawsynram		East Khasi Hills (Total)		Total Children
	Male Children	Female Children	Male children	Female children	Male children	Female children	
0– 11	22 (7.67%)	22 (7.67%)	21 (7.32%)	20 (6.97%)	43 (14.98%)	42 (14.63%)	85 (29.62%)
12–23	14 (4.88%)	13 (4.53%)	16 (5.57%)	12 (4.18%)	30 (1.45%)	25 (8.71%)	55 (19.16%)
24–35	8 (2.79%)	13 (4.53%)	13 (4.53%)	9 (3.14%)	21 (7.32%)	22 (7.67%)	43 (14.98%)
36–47	12 (4.18%)	9 (3.14%)	9 (3.14%)	16 (5.57%)	21 (7.32%)	25 (8.71%)	46 (16.03%)
48–59	16 (5.57%)	11 (3.83%)	17 (5.92%)	14 (4.88%)	33 (11.50%)	25 (8.71%)	58 (20.21%)
Total	72 (25.09%)	68 (23.69%)	76 (26.48%)	71 (24.73%)	148 (51.57%)	139 (48.43%)	287 (100%)

The age-group-wise distribution of the children studied from Mawpat and Mawsynram blocks of East Khasi Hills district is presented in Table 3. A total of 287 children were considered for the present study, following specific inclusion and exclusion criteria. These children were categorized into five standard age groups: 0–11 months, 12–23 months, 24–35 months, 36–47 months, and 48–59 months. Among these, the highest concentration of children was recorded in the youngest age group (0–11 months). This was followed by the 48–59 months age group, which constituted 20.21% of the total sample. The relatively high number of children at both the youngest and oldest ends of the age spectrum suggests a stable birth trend over the last five years within these blocks. An interesting demographic trend observed in both Mawpat and Mawsynram blocks was the gender disparity among children. In both regions, the number of female children was consistently lower than that of male children across all age groups.

Data Collection

Relevant data for this study were collected through an intensive as well as extensive household survey among the Khasi with the help of structured schedules of following categories.

- Part A - It covered general information of the informant and his/her family members related to their health status, general hygiene practices, morbidity and mortality status.
- Part B - It was exclusively for women (of 17-49 years of age), who belong to any physiological state of womanhood i.e., menarche, pregnancy, lactating and/or mother having child below 59 months of age.
- Part C - This schedule was used for the assessment of hygienic practices of women such as day - to - day b personal hygiene practices and menstrual hygiene practices, including addiction behaviour of women.
- Part D - It was to ascertain current nutritional health status of women and children through anthropometric measurements and hematological examinations.

In addition to the use of a pre-tested structured schedule**,** the study also incorporated semi-structured interviewsandgroup discussions with selected Khasi mothers and relevant stakeholders. The perspectives of stakeholders, including local health workers, Anganwadi workers, community leaders, and family members, were also considered to obtain a holistic view of systemic and community-level factors that either facilitate or obstruct the intended outreach of these schemes. These qualitative methods were employed to gain deeper insights into the patterns of participation of pregnant women, lactating mothers, and their children in various government-sponsored health and nutrition schemes. The aim was to explore not only the level of awareness and accessibility of these programs but also to identify potential barriers that might hinder their effective utilization.

This mixed-methods approach ensured a more nuanced understanding of the real-world challenges faced by the Khasi mothers in accessing maternal and child health services in the region.

ScoresandIndices

To assess the educational status of the studied population, in addition to pre-literate state, different level of attaining formal education of individual of 6 years and above ages were taken into consideration. Accordingly, each variable was categorized into specific level of categories and allotted scores.

Table 4: Scores for variables of Educational status

Variables and parameters	Score
1. Highest educational attainment of any male member in the family	
Non– literate	0
Upto class 5	1
6 – 8	2
9 – 10	3
11 – 12	4
Graduation and above	5
2. Highest educational attainment of any female member in the family	
Non– literate	0
Upto class 5	1
6 – 8	2
9 – 10	3
11 – 12	4
Graduationandabove	5
3. Number of family members who have attained college education	
1	1
2	2
3	3
4	4
5	5
6	6
7	7
4. Number of family members aged 10 years and above with less than primary education	
0	0
1	1
2	2
3	3

The formula used to prepare the educational index is: [Highest educational attainment of any male member in the family (1) + Highest educational attainment of any female member in the family (2) + Number of family members who have attained college education (3) + Number of family members aged 10 years and above with less than primary education (4)]

Table 5: Scores for Educational Index based on categories

Score	Categories
0 – 5	Poor
6 – 10	Satisfactory
11 – 15	Above average
16 and above	High

To assess the economic status of the studied population, annual per capita income, savings, debt, agricultural land etc. were taken into consideration for the scoring system. Each variable was categorized into certain categories and given scores.

Table 6: Scores for variables of Economic status

Variables and parameters	Score
1. Per capita Income (Annual in Rs.)	
0-25000	1
25001-50000	2
50001-75000	3
75001-100000	4
100001-125000	5
125001-15000	6
150001-175000	7
175001-200000	8
200001and above	9
2. Debt	
No Debt	0
Upto1 Lakhs	1
Above1 Lakhs	2
3. Savings	
No Savings	0
Upto1 Lakhs	1
Above1 Lakhs	2
4.Agricultural land	
0 Acre	0
0-3 Acres	1
3-6 Acres	2
More than 6 Acres	3
5. Motor vehicle	
No Vehicle	0

Two Wheeler	1
Car	2
Two wheeler + Car	3
2 Car and more	4
6. Livestock	
Yes	1
No	0

The formula used to prepare the economic index is: [Per Capita Income (1)+ Debt (2) + Savings (3) + Agricultural Land (4) + Motor vehicle (5) + Cattle (6)]

Table 7: Scores for Economic Index

Score	Categories
0 – 2	Poor
3 – 5	Satisfactory
6 – 8	Above average
9 and above	High

To evaluate household hygiene status, specific variables were assigned scores, culminating in the calculation of a **Household Hygiene Index**. This index then served as the basis for categorizing all studied households within the two blocks of the present study into distinct hygiene levels: **Poor, Satisfactory, Above Average, and High.** This categorization allows for a nuanced understanding of the hygiene practices across the study population and facilitates comparisons between the two blocks.

Table 8: Scores for Variables of Household Hygiene Status

Questions	Score
1. Type of House	
Kaccha	1
Semi-Pucca	2
Pucca	3
2. Predominant material of the Roof	
Grass thatched/Bamboo/Wood/Mud	1
GI Metal/Asbestos sheets/Tin	2
Concrete	3
3. Predominant material of the Floor	
Mud	1
Wood/Bamboo	2
Bricks/Stone	3

Mosaic floor/Tiles/Marble/Cement	4
4. Source of Light	
No electricity	
Electricity	1
5. Cleaning of Rooms	
Once in a week	1
2-3 day in a week	2
Daily	3
6. Method of Cleaning	
Dry mopping	1
Mopping with plain water	2
Mopping with disinfectant	3
No cleaning	
7. Cooking Place/ Kitchen	
Cooking inside a room	1
Outdoor	2
Separate Kitchen	3
8. Mode of Cooking	
Open fire (temporary)	1
Kerosene	1.5
Traditional hearth + Earthen Chullah	2
Open fire + LPG	2.5
Open fire + Electric oven	3
Earthen Chullah + LPG	3.5
Electric oven	4
Electric oven + LPG	4.5
9. Utensils used for Cooking	
Earthen pot	1
Metallic (Aluminum/Steel/Iron pot)	2
10. Material used for Cleaning of Utensils	
Ash	1
Chemicals (Soap/Detergent)	2
11. Source of Water for Domestic uses	
Pond/Stream/River	1
Well / Tube well	2
Tap water/Piped water	3
12. Source of Drinking Water	
Pond/Stream/River	1

Well / Tube well	2
Tap water/ Piped water	3
13. Do you Purify Drinking water?	
No	0
Yes	1
14. If 'Yes' How Do You Purify Drinking water?	
Boil	1
Use water filter	2
15. Cleaning of water storage Pot	
Sometime	1
When Dirty	2
Fortnightly	3
Once in a week	4
2-3 day in a week	5
Daily	6
16. Method of disposal of household Garbage	
Disposed of within household yard or plot	1
Buried or burned	2
Collected by local civic body/ Collected by local NGOs	3
18. Drainage facility	
No drainage	0
Kaccha	1
Pucca	2
19. Type of Latrine	
Open/No Latrine	0
Flush latrine	1
Pit latrine without slab	2
Pit latrine with slab	3
Western Toilet	4
20. Source of Water in Toilet	
No	0
Yes	1
21. Any mosquito repellent used	
None	0
Electric vaporizer machine	1
Mosquitoes net	2
22. Do you use any material for keeping the flies and insects away?	
No	0

Yes	1
23. Do you keep any birds or goats/sheep/cattle/dogs within the premises of the house?	
Yes	0
No	1
24. Do you ensure cleanliness of the enclosures of birds/animals on a regular basis?	
No	0
Yes	1

The formula used to prepare the household hygiene index is: [Type of House (1) + Predominant material of the Roof (2) + Predominant material of the Floor (3) + Source of Light (4) + Cleaning of Rooms (5) + Method of Cleaning (6) + Cooking Place/ Kitchen (7) + Mode of Cooking (8) + Utensils used for Cooking (9) + Material used for Cleaning of Utensils (10) + Source of Water for Domestic uses (11) + Source of Drinking Water (12) + Do you Purify the Drinking water? (13) + If 'Yes' How Do You Purify Drinking water? (14) + Cleaning of water storage Pot (15) + Method of disposal of household Garbage (16) + Drainage facility (17) + Type of Latrine (18) + Source of Water in Toilet (19) + Any mosquito repellent used (20) + Do you use any material for keeping the flies and insects away? (21) + Do you keep any birds or goats/sheep/cattle/dogs within the premises of the house? (22) + Do you ensure cleanliness of the enclosures of birds/animals on a regular basis? (23)]

Table 9: Scores of household Hygiene Index based on Categories

Scores	Categories
0 - 15	Poor
16 - 30	Satisfactory
31 - 45	Above average
46 and above	High

To assess the household Hygiene index of individual studied household, the score was categorized into 4 categories namely, Poor (0 - 15), Satisfactory (16 - 30), Above average (31 - 45) and High (46 and above).

Further, to assess the personal hygienic sense and practices, variables such as washing of hands before meal, brushing of teeth, bathing place etc. were considered.

Table 10: Scores for variables of Personal Hygiene Status

Variables and parameters	Score
1. Do you wash hands before taking meals?	
No	0
Yes	1
1. 1If 'yes', how do you wash?	
With water only	1
With water and soap	2
2. How frequently do you brush your teeth?	
Once in a day	1
Twice in a day	2
3. What materials do you use for brushing?	
Tooth paste and brush	1
4. Bathing practice (during winter season)	
Once in a week	1
2-3days in a week	2
Everyday	3
5. Bathing practice (in other seasons)	
Once in a week	1
2-3days in a week	2
Everyday	3
6. Where do you take bath usually?	
Stream/Pond	1
Outside	2
Bathroom	3
7. How often do you use soap during bath?	
2-3days in a week	1
Every time	2
8. How often do you comb your hair?	
2-3days in a week	1
Everyday	2
9. How frequently do you trim your nails?	
Monthly	1
Fortnightly	2
Weekly	3
10. Do you use footwear habitually?	
No	0
Yes	1

11. Where do you usually go for defecation?	
Open Field	0
Common latrine/Community latrine	1
Private latrine	2
12. Do you wash your hands habitually after defecation?	
No	0
Yes	1
12.1.If 'yes', what material do you use for washing hands?	
Water only	1
Water and soap	2
Toilet paper	3

The formula used to prepare the personal hygiene index is: [Do you wash your hands before taking meals regularly? (1) + If 'yes', how do you wash? (1.1) + How frequently do you brush your teeth? (2) + What materials do you use for brushing? (3) + Bathing Practice (in winter) (4) + Bathing Practice (in other seasons) (5) + Where do you normally take baths? (6) + How often do you use soap during bathing? (7) + How often do you comb your hair? (8) + How frequently do you trim your nails? (9) + Do you use footwear habitually? (10) + Where do you usually go for defecation? (11) + Do you wash your hands habitually after defecation? (12) + If 'yes', what material do you use for washing hands? (12.1)]

Table 11: Scores for variables of personal Hygiene Index

Scores	Categories
0 - 7	Poor
8 - 14	Satisfactory
15 - 21	Above average
22 and above	High

To assess the Personal Hygiene index for all studied individual, the score was categoriesd into 4 categories namely, Poor (0 - 7), Satisfactory (8 - 14), Above average (15 - 21) and High (22 and above).

Inclusion and Exclusion Criteria of the Present Study

Criteria for inclusion

- Children under the age of 5 years.
- Women, pregnant and lactating under the age group 15-49 years.
- Participants who have given verbal consent.

Criteria for exclusion

- Children above 5 years of age.
- Women above 49 years and below 15 years of age.
- Individuals, who are suffering from physical deformities or chronic diseases.

Assessment of Nutritional Status

- For the assessmentofnutritionalstatus of women, anthropometric measurements, such as height, weight, mid-upper arm circumference, hip circumference, waist circumference and physiological variables, such as blood pressure, hemoglobin level and blood glucose level (random) were considered.
- For children, anthropometric measurements, such as height, weight, mid-upper arm circumference, head circumference, chest circumference and physiological variables like hemoglobin level were considered.

a) AnthropometricMeasurements

- Height- For women and children above 2 years of age, height was measured with the help of an Anthropometric rod to the nearest 0.10 cm and for children up to 2 years of age Infantometer was used to measure the height.
- Weight - Weight was measured with the help of a digital weighing machine (Omron, model - HN-286, manufactured by Krell Pricision Co., Ltd.)
- Mid-Upper Arm Circumference, Head Circumference, Chest Circumference, Waist Circumference, Hip Circumference -were measured with a Harpendene anthropometric tape (manufactured by Holtain Ltd).

Classification

● **Mid-Upper Arm Circumference (MUAC):** Mid-Upper Arm Circumference was measured to assess the status of malnourishment in both women and children.

● For the assessment of nutritional status of all adult women MUAC was measured as recommended by Tang, et.al. 2020. The criteria for the measurement of malnutrition are given as follows:

Normal	Undernourished
≥24	< 24

● For the assessment of nutritional status of children aged of 0-5 years MUAC was calculated using z-score as recommended by WHO, 2009. The criteria for the

measurement of malnutrition are given as follows:

Normal	Moderate malnutrition	Severe malnutrition
-2SD to+2 SD	-3SD to+3 SD	>-3 SD to +3 SD

● **Waist Circumference:** Assessment of waist circumference of women was used to assess the risk of metabolic complications as recommended by WHO, 2011. Classification of assessment of risk of metabolism are given as follows:

Cut-off points	Risk of metabolic complications
>80	Increased
80.1- 87.9	Moderately increased
>88	Substantially increased

Derived Variables

● **Body-Mass Index (BMI):** From the body weight and height, Body Mass Index (BMI) is applied to evaluate current state nutritional status.

● For adult women -Body-Mass Index (BMI) was calculated to assess the nutritional status of women as recommended by World Health Organization (2004).

$$BMI = weight\ (kg)/height\ (m)^2$$

Classifications of the measurement of malnutrition are given as follows:

Under weight	Normal	Over weight
< 18.5 kg /m^2	18.5-24.9 kg /m^2	≥ 25 kg /m^2

● For children - Child growth standards of the World Health Organization, 2006 for 0-5 years of age and references developed by the World Health Organization based on z-scores were used. Z-scores were calculated using Microsoft Excel. For the assessment of nutritional status of children, derived variables such as height-for-age (stunting) and weight-for-age (wasting) were calculated using z-score.

Classifications for measuring different states of malnutrition are given as follows:

Normal	Moderate malnutrition	Severe malnutrition
-2SD to +2 SD	-3SD to +3 SD	>-3 SD to +3 SD

● **Waist-Hip Ratio (WHR):** With the help of the waist and hip circumference Waist-Hip Ratio (WHR) was calculated. Waist-to-hip ratio was computed as *waist circumference (cm)/ hip circumference (cm)*. With the help of the Waist-Hip Ratio (WHR) risk of metabolic complications of women was analyzed as recommended by WHO, 2011.

The criteria for the measurement of risk of metabolism are given as follows:

Cut-off points	Risk of metabolic complications
< 0.85	Normal
>0.86	Risk

- **Waist-Height Ratio (WHtR):** Waist-height ratio was computed as *waist circumference (cm)/ height (cm)*. With the help of the waist-height ratio (WHtR) risk of central adiposity of women was analyzed using a reference recommended by Hsieh and Muto (2003). Classification of ascertaining risk of central adiposity are given as follows:

Cut-off points	Risk of central adiposity
≥ 0.5	Normal
< 0.86	Risk

Physiological Variables

- **Assessment of Anaemic Status:** The prevalence of anaemia was estimated by using the reference standards recommended by WHO (1968). Hemoglobin level (gm./dL.) was measured by the Haemoglobin testing apparatus of Mission Hb. Anaemic status of both women and children was assessed accordingly.
    - For assessment of anaemic status of non - pregnant women of 15- 49 years, the reference criteria were taken as follows:

Normal	Mild anaemia	Moderate anaemia	Severe anaemia
≥ 12	11.0 -11.9	8.0-10.9	<8.0

    - For assessment of anaemic status of pregnant women of 15-49 years reference criteria were taken as follows:

Normal	Mild anaemia	Moderate anaemia	Severe anaemia
≥ 11	10.0-10.9	7.0-9.9	<7.0

- **Assessment of Blood Glucose Level (random):** The prevalence of diabetes was estimated by using the reference standards recommended by American Diabetes Association, 2022. The blood glucose level (random) was measured by CODEFREE, Blood Glucose Monitoring System. For the assessment of blood glucose level (random) the following reference criteria were taken:

Normal	Pre-Diabetic	Diabetic
<140	140-199	>200

- **Assessment of Hypertension:** To measure blood pressure, an inflated cuff is usually placed around the arm. Omron Automatic Blood Pressure Monitor, model - HEM- 8712 was used for this purpose. Classification of blood pressure for the present study was followed by the recommendation of JNC8 (Eighth Report of the Joint National Committee) of WHO, 2015. Classification used for the assessment of hypertension are as follows:

Normal	Pre-Hypertension	Stage-I Hypertension	Stage-II Hypertension
SBP <120 and DBP <80	SBP 120-139 or DBP 80-89	SBP140-150 or DBP 90-99	SBP >160 or DBP >100

Data Entry and Analysis: For data entry of Mawpat block Microsoft Excel was used and for data analysis SPSS (Statistical Package for Social Sciences) trial version was used and for data entry and data analysis of Mawsynram block,Microsoft Excel was used.

Chapter 1

Socio – Demographic Profile

Socio-demographic profile refers to a description of the characteristics of a group of people or a population, combining both social and demographic factors. It provides a comprehensive overview of individuals' backgrounds, lifestyles, and societal positions, which helps to understand patterns and trends.The demographic profile of a population is crucial for understanding the characteristics of a study participants and how they might influence research outcome. The demographics of a population provide detailed information on social, economic and housing characteristics. Moreover, these data can be used as a powerful tool for understanding change over time and for uncovering the needs or strengths of a particular community to guide planning, policy development etc. Especially, socio-demographic variability among different culture and ethnicity highly influences the health seeking behaviour (Mou TJ et al. 2022).

Table 12: Age and Sex Distribution of the Studied Population of Mawpat and Mawsynram Block of East Khasi Hills

Age group (in years)	Mawpat		Mawsynram		East Khasi Hills (2 Blocks)		Total	Sex Ratio
	Male	Female	Male	Female	Male	Female		
0 - 5	91 (5.55%)	83 (5.06%)	84 (5.12%)	81 (4.94%)	175 (10.66%)	164 (9.99%)	339 (20.66%)	937.14
6 – 10	68 (4.14%)	57 (3.47%)	55 (3.35%)	48 (2.93%)	123 (7.49%)	105 (6.40%)	228 (13.89%)	853.66
11 – 15	41 (2.50%)	41 (2.50%)	47 (2.86%)	31 (1.89%)	88 (5.36%)	72 (4.39%)	160 (9.75%)	818.18
16 – 20	36 (2.19%)	22 (1.34%)	32 (1.95%)	21 (1.28%)	68 (4.14%)	43 (2.62%)	111 (6.76%)	632.35
21 – 25	39 (2.38%)	32 (1.95%)	41 (2.50%)	42 (2.56%)	80 (4.88%)	74 (4.51%)	154 (9.38%)	925.00
26 – 30	53 (3.23%)	61 (3.72%)	40 (2.44%)	24 (1.46%)	93 (5.67%)	85 (5.18%)	178 (10.85%)	913.98

31 – 35	31 (1.89%)	38 (2.32%)	43 (2.62%)	50 (3.05%)	74 (4.51%)	88 (5.36%)	162 (9.87%)	1189.19
36 - 40	32 (1.95%)	19 (1.16%)	24 (1.46%)	27 (1.65%)	56 (3.41%)	46 (2.80%)	102 (6.22%)	821.43
41 – 45	15 (0.91%)	11 (0.67%)	14 (0.85%)	15 (0.91%)	29 (1.77%)	26 (1.58%)	55 (3.35%)	896.55
46 – 50	10 (0.61%)	15 (0.91%)	16 (0.98%)	12 (0.73%)	26 (1.58%)	27 (1.65%)	53 (3.23%)	1038.46
51 – 55	11 (0.67%)	9 (0.55%)	8 (0.49%)	4 (0.24%)	19 (1.16%)	13 (0.79%)	32 (1.95%)	684.21
56 – 60	3 (0.18%)	11 (0.67%)	4 (0.24%)	8 (0.49%)	7 (0.43%)	19 (1.16%)	26 (1.58%)	2714.29
61 – 65	3 (0.18%)	7 (0.43%)	2 (0.12%)	8 (0.49%)	5 (0.30%)	15 (0.91%)	20 (1.22%)	3000.00
66 – 70	1 (0.06%)	0	2 (0.12%)	3 (0.18%)	3 (0.18%)	3 (0.18%)	6 (0.37%)	1000.00
71 – 75	0	2 (0.12%)	1 (0.06%)	2 (0.12%)	1 (0.06%)	4 (0.24%)	5 (0.30%)	4000.00
76 - 80	1 (0.06%)	2 (0.12%)	0	2 (0.12%)	1 (0.06%)	4 (0.24%)	5 (0.30%)	4000.00
81 – 85	0	0	0	0	0	0	0	0.00
86 – 90	0	3 (0.18%)	0	0	0	3 (0.18%)	3 (0.18%)	0.00
Above 90	0	2 (0.12%)	0	0	0	2 (0.12%)	2 (0.12%)	0.00
Total	435 (26.51%)	415 (25.29%)	413 (25.17%)	378 (23.03%	848 (51.68%)	793 (48.32%)	1641 (100%)	935.14

Table 13: Age and Sex Distribution of the Studied Population of Mawpat

Age group (in years)	Mawpat		Total
	Male	Female	
0 - 5	91 (10.71%)	83 (9.76%)	174 (20.47%)
6 – 10	68 (8.0%)	57 (6.70%)	125 (14.70%)
11 – 15	41 (4.82%)	41 (4.82%)	82 (9.64%)
16 – 20	36 (4.23%)	22 (2.58%)	58 (6.82%)
21 – 25	39 (4.58%)	32 (3.76%)	71 (8.35%)
26 – 30	53 (6.23%)	61 (7.17%)	114 (13.41%)
31 – 35	31 (3.64%)	38 (4.47%)	69 (8.11%)
36 - 40	32 (3.76%)	19 (2.23%)	51 (6.0%)
41 – 45	15 (1.76%)	11 (1.29%)	26 (3.05%)
46 – 50	10 (1.18%)	15 (1.76%)	25 (2.94%)
51 – 55	11 (1.29%)	9 (1.05%)	20 (2.35%)
56 – 60	3 (0.35%)	11 (1.29%)	14 (1.64%)
61 – 65	3 (0.35%)	7 (0.82%)	10 (1.17%)
66 – 70	1 (0.11%)	0	1 (0.11%)
71 – 75	0	2 (0.23%)	2 (0.23%)
76 - 80	1 (0.11%)	2 (0.23%)	3 (0.35%)
81 – 85	0	0	0

86 – 90	0	3 (0.35%)	3 (0.35%)
Above 90	0	2 (0.23%)	2 (0.23%)
Total	435 (51.18%)	415 (48.82%)	850 (100.00)

Table 14: Age and Sex Distribution of the Studied Population of Mawsynram

Age group (in years)	**Mawsynram**		**Total**
	Male	**Female**	
0 - 5	84 (10.61%)	81 (10.24%)	165 (20.85%)
6 – 10	55 (6.95%)	48 (6.06%)	103 (13.02%)
11 – 15	47 (5.94%)	31 (3.91%)	78 (9.86%)
16 – 20	32 (4.04%)	21 (2.65%)	53 (6.70%)
21 – 25	41 (5.18%)	42 (5.31%)	83 (10.49%)
26 – 30	40 (5.05%)	24 (3.03%)	64 (8.09%)
31 – 35	43 (5.43%)	50 (6.32%)	93 (11.75%)
36 - 40	24 (3.03%)	27 (3.41%)	51 (6.44%)
41 – 45	14 (1.76%)	15 (1.89%)	29 (1.14%)
46 – 50	16 (2.02%)	12 (1.51%)	28 (3.53%)
51 – 55	8 (1.01%)	4 (0.50%)	12 (1.51%)
56 – 60	4 (0.50%)	8 (1.01%)	12 (1.51%)
61 – 65	2 (0.25%)	8 (1.01%)	10 (1.26%)

66 – 70	2 (0.25%)	3 (0.37%)	5 (0.63%)
71 – 75	1 (0.13%)	2 (0.25%)	3 (0.0.38%)
76 - 80	0	2 (0.25%)	2 (0.25%)
81 – 85	0	0	0
86 – 90	0	0	0
Above 90	0	0	0
Total	413 (52.21%)	378 (47.79%	791 (100.00%)

Table 15: Age and Sex Distribution of the Studied Population of Block of East Khasi Hills (Mawpat, Mawsynram)

Age group (in years)	**East Khasi Hills (2 Blocks)**		**Total**	**Sex Ratio**
	Male	**Female**		
0 - 5	175 (10.66%)	164 (9.99%)	339 (20.66%)	937.14
6 – 10	123 (7.49%)	105 (6.40%)	228 (13.89%)	853.66
11 – 15	88 (5.36%)	72 (4.39%)	160 (9.75%)	818.18
16 – 20	68 (4.14%)	43 (2.62%)	111 (6.76%)	632.35
21 – 25	80 (4.88%)	74 (4.51%)	154 (9.38%)	925.00
26 – 30	93 (5.67%)	85 (5.18%)	178 (10.85%)	913.98
31 – 35	74 (4.51%)	88 (5.36%)	162 (9.87%)	1189.19

36 - 40	56 (3.41%)	46 (2.80%)	102 (6.22%)	821.43
41 – 45	29 (1.77%)	26 (1.58%)	55 (3.35%)	896.55
46 – 50	26 (1.58%)	27 (1.65%)	53 (3.23%)	1038.46
51 – 55	19 (1.16%)	13 (0.79%)	32 (1.95%)	684.21
56 – 60	7 (0.43%)	19 (1.16%)	26 (1.58%)	2714.29
61 – 65	5 (0.30%)	15 (0.91%)	20 (1.22%)	3000.00
66 – 70	3 (0.18%)	3 (0.18%)	6 (0.37%)	1000.00
71 – 75	1 (0.06%)	4 (0.24%)	5 (0.30%)	4000.00
76 - 80	1 (0.06%)	4 (0.24%)	5 (0.30%)	4000.00
81 – 85	0	0	0	0.00
86 – 90	0	3 (0.18%)	3 (0.18%)	0.00
Above 90	0	2 (0.12%)	2 (0.12%)	0.00
Total	848 (51.68%)	793 (48.32%)	1641 (100.00%)	935.14

Fig 2: Population Pyramid of Studied Population of Mawpat Block

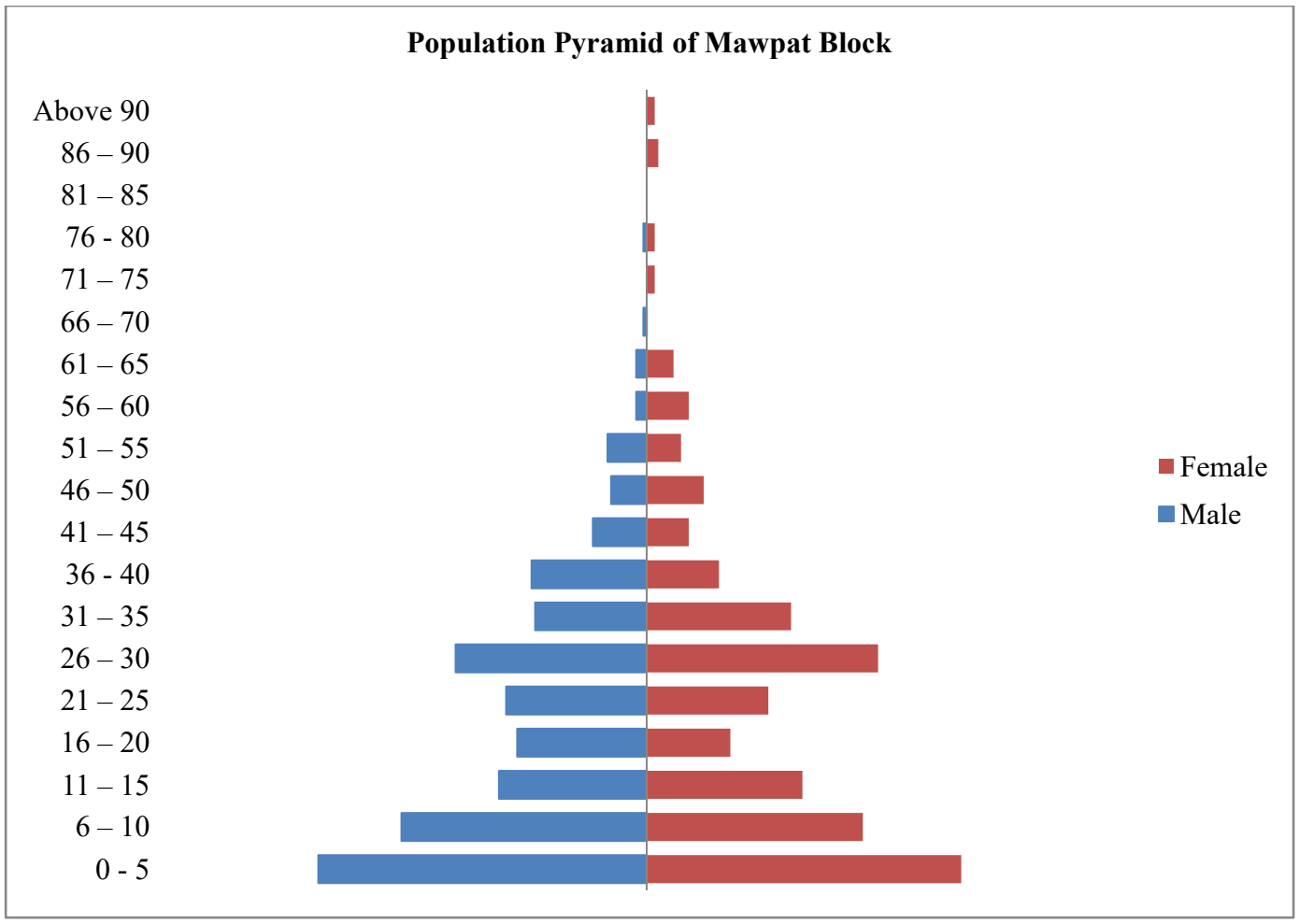


Fig 3: Population Pyramid of Studied Population of Mawsynram Block

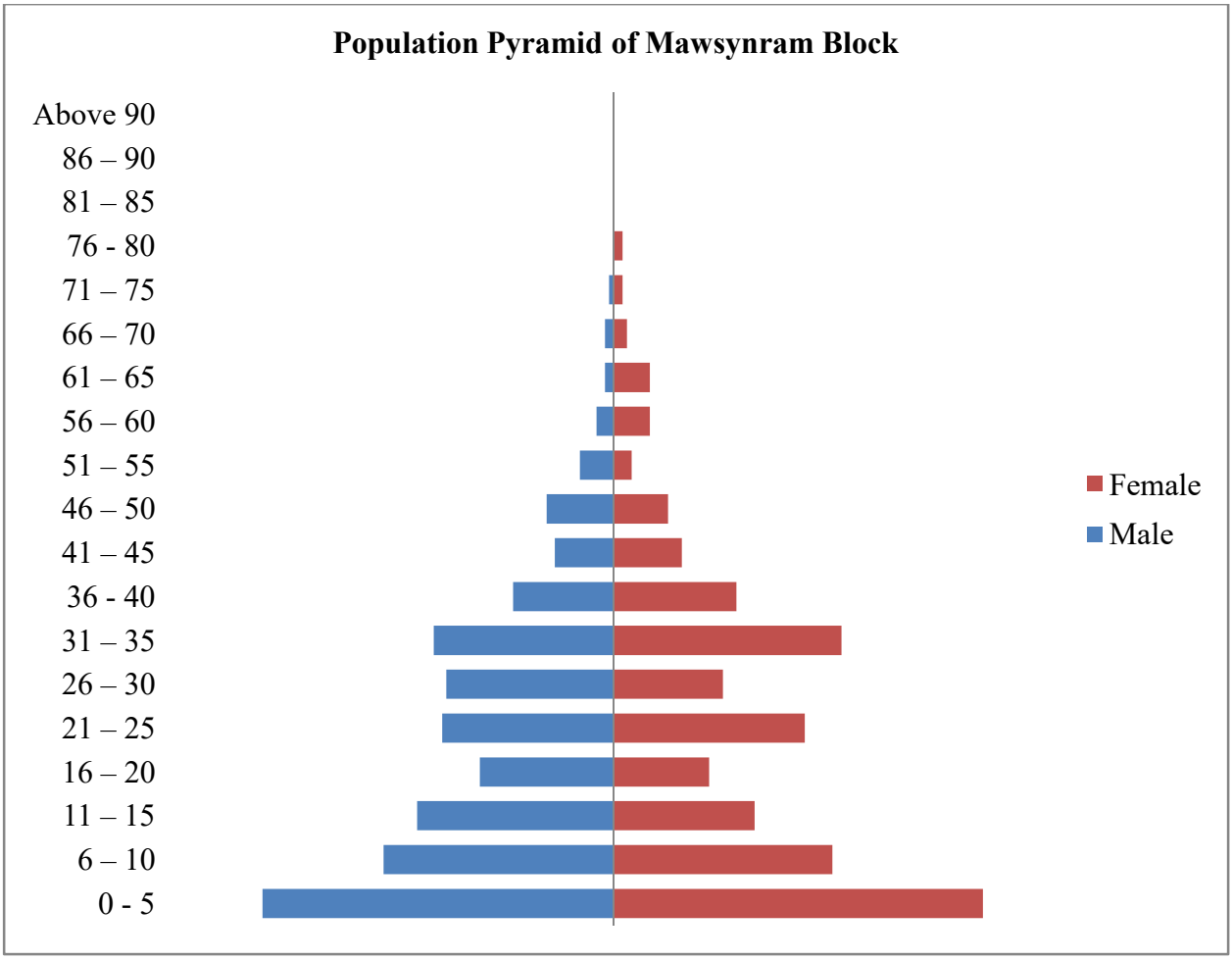


Fig 4: Population Pyramid of Studied Population of East Khasi Hills District

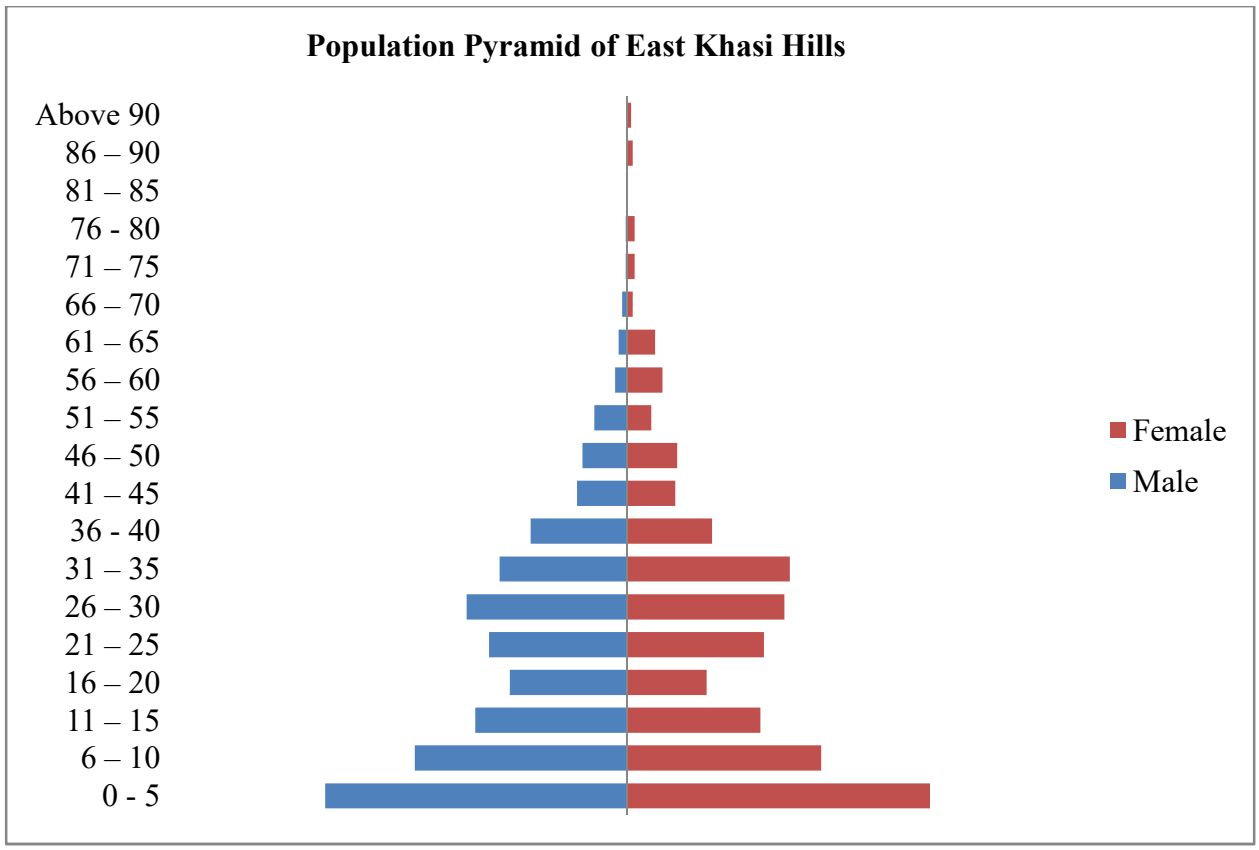


Table 15 presents the age and sex distribution of the studied population from Mawpat and Mawsynram blocks in East Khasi Hills. A total of 1,641 individuals were recorded across both blocks, comprising 848 males and 793 females. Among males, Mawpat reported 435 individuals, while Mawsynram recorded 413. For females, Mawpat had a slightly higher number (415) compared to Mawsynram (378).

The total age range of the population spanned from 0 to 90 years and above, and was categorized into 19 age groups at 5-year intervals. In the initial six age groups—0–5, 6–10, 11–15, 16–20, 21–25, and 26–30 years—males outnumbered females significantly suggesting a higher male birth rate, better male survival in early years. However, in the subsequent age groups, the number of females consistently surpassed that of males which could reflect higher female longevity or selective male out-migration for work.

With regard to sex ratio, the overall Khasi population in the present study exhibited a lower sex ratio (935.14 females per 1,000 males) than both the national average (1020) and Meghalaya's state average (982), as reported in NFHS-5 (2019–21) indicating a demographic imbalance. Notably, the sex ratio was significantly lower than both benchmarks in several specific age

groups, including 6–10, 16–20, 36–40, 41–45, and 51–55 years. which could point to gender-based disparities in health outcomes, access to care, or socio-cultural biases affecting female survival or reporting. Such a skewed sex ratio, particularly in early and reproductive age groups, may have long-term social and health implications for the Khasi population, needs closer examination of gender-related health practices and social structures in these regions.

Table 16: Sub Tribe Distribution of the Studied Mothers of Mawpat and Ri-Mawsynram Block of East Khasi Hills

Sub-Tribe	Mawpat	Mawsynram	East Khasi Hills (2 Blocks)
Niam Khasi	1 (0.33%)	0	1 (0.33%)
Khynriam Khasi	148 (49.17%)	99 (32.89%)	249 (82.18%)
Maram Khasi	0	4 (1.33%)	4 (1.32%)
War Khasi	0	48 (15.95%)	48 (15.84%)
Bhoi Khasi	1 (0.33%)	0	1 (0.33%)
Total	150 (49.83%)	151 (50.17%)	301 (100%)

The above table showed the sub – tribe distribution of the studied female population of the Khasi community of Mawpat and Mawsynram blocks of East Khasi Hills District of Meghalaya. Five sub – tribes were found namely, Niam Khasi, Khynriam Khasi, Maram Khasi, War Khasi and Bhoi Khasi. Majority of the studied mothers in both Mawpat and Mawsynram blocks that is 49.17% and 32.89% were identified asKhynriam Khasi, whereas, other sub – tribes such as Niam Khasi (0.33%) and Bhoi Khasi (0.33%) were only identified from Mawpat block. Also, 1.33% mothers and 15.95% mothers from Mawsynram block were identified as Maram Khasi and War Khasi respectively.

Table 17: Marital status of the studied population in the East Khasi Hills

Marital Status	Mawpat	Mawsynram	Total
Unmarried	437 (26.63%)	484 (29.49%)	921 (56.12%)
Married	321 (19.56%)	326 (19.86%)	647 (39.42%)
Separated	14 (0.85%)	15 (0.91%)	29 (1.77%)
Widowed	19 (1.16%)	25 (1.52%)	44 (2.68%)
Total	791 (48.20%)	850 (51.79%)	1641 (100%)

Fig 5: Marital Status of the Studied Population of Mawpat Block

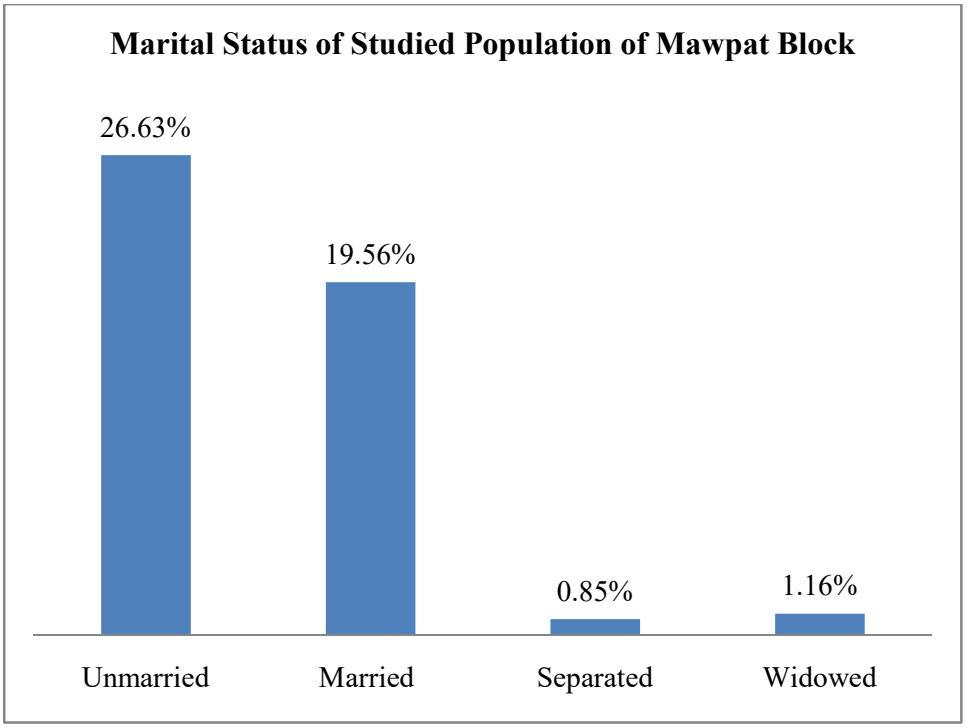


Fig6: Marital Status of the Studied Population of Mawsynram Block

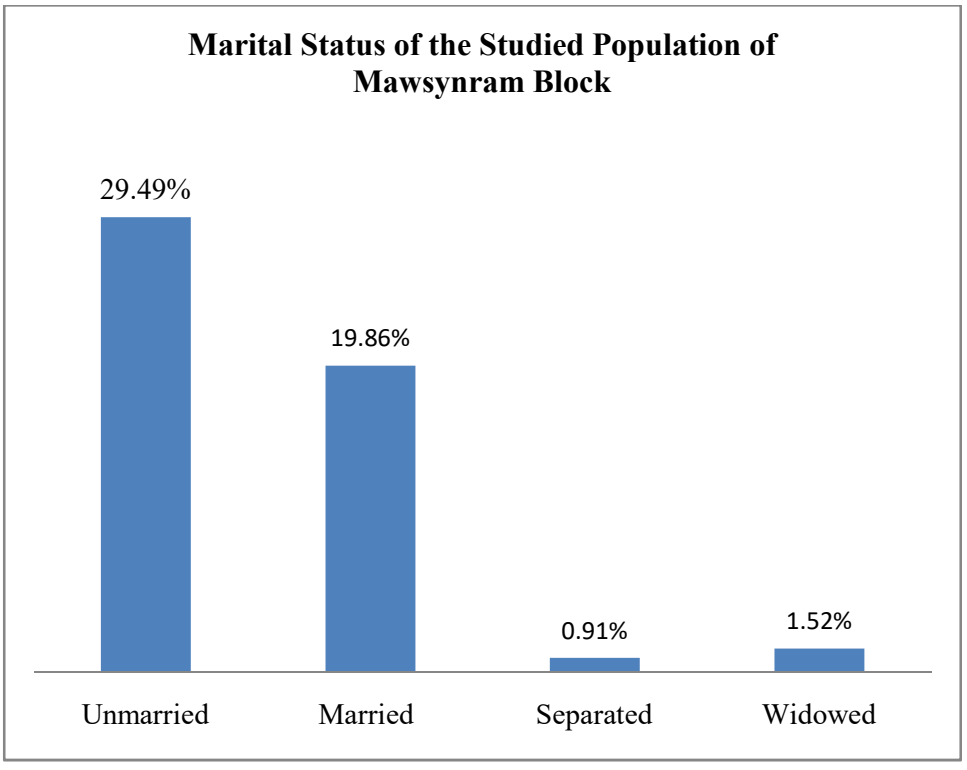
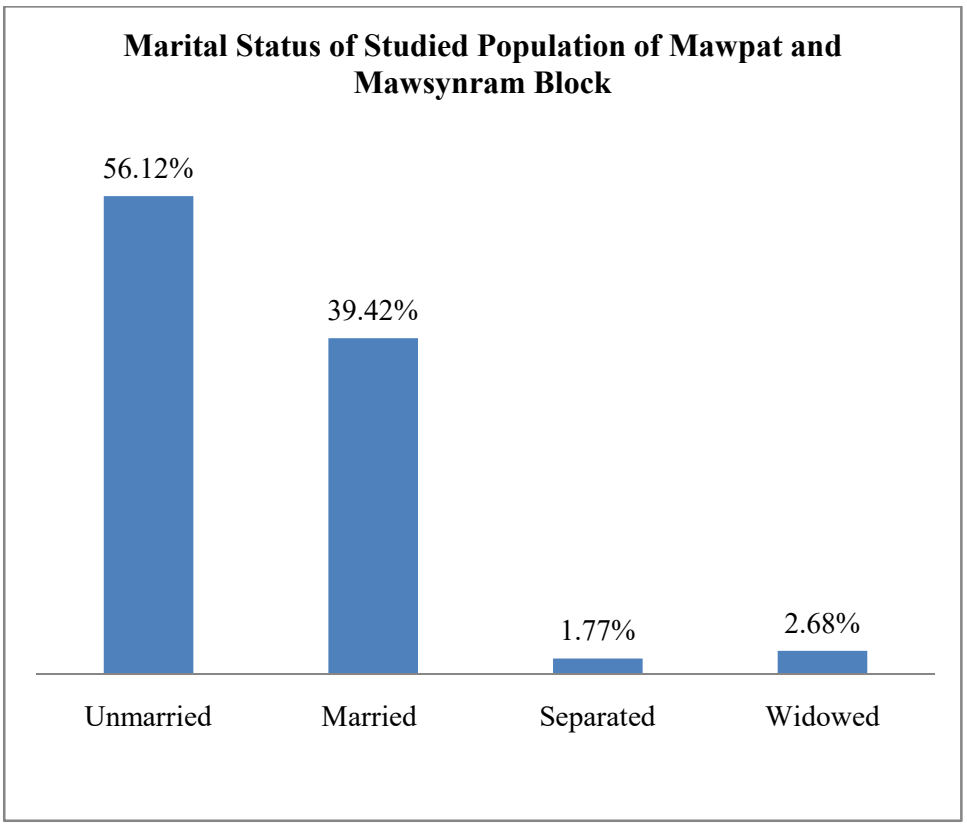


Fig 7: Marital Status of the Studied Population of Mawpat and Mawsynram Blocks of East Khasi Hills



The marital status data from Mawpat and Mawsynram in East Khasi Hills reveals several noteworthy demographic patterns. Out of the total surveyed population of 1,641 individuals, Mawsynram accounts for a slightly larger share (51.79%) compared to Mawpat (48.20%). The majority of the population—56.12%—is unmarried, with Mawsynram (29.49%) showing a marginally higher percentage than Mawpat (26.63%). This high proportion of unmarried individuals may suggest a younger demographic profile or a trend toward later marriages in the region. Married individuals make up 39.42% of the total population, with nearly equal representation in both Mawpat (19.56%) and Mawsynram (19.86%), indicating a relatively balanced marital status across the two areas. Separated individuals represent only 1.77% of the population, while widowed persons account for 2.68%, with Mawsynram again slightly ahead in both categories. The low percentages of separated and widowed individuals may point to marital stability and/or a younger or mid-aged population structure with relatively few elderly individuals. Overall, the data highlights a population where the majorityremain unmarried, with balanced marital figures between the two regions and a relatively small proportion of separated and widowed individuals.

Table 18: Family Size of studied households of Mawpat and Mawsynram Block of East Khasi Hills

Family Size (Members of the family)	Mawpat	Mawsynram	East Khasi Hills (2 Blocks)
1-4	62 (20.60%)	58 (19.27%)	120 (39.87%)
5-9	82 (27.24%)	84 (27.91%)	166 (55.15%)
10 and above	6 (1.99%)	9 (2.99%)	15 (4.98%)
Total	150 (49.83%)	151 (50.17%)	301 (100%)

The above table demonstrates the family size of the studied participants of Mawpat and Mawsynram block of East Khasi Hills District of Meghalaya. The family size of the present study has been categorized into three groups viz., 1 – 4, 5 – 9, and 10 and above. Total 20.60% of families of Mawpat showed their family size 1 – 4 and 27.24% of families showed family size 5 – 9. Only 6 families (1.99%) from Mawpat were identified with 10 and above family size. On the other hand, in case of Mawsynram block, family size 5 – 9 was most prevalent (27.91%) followed by family size (19.27%). Only 2.99% of families were identified with family size 10 and above.

Table 19: Family Types of the studied households in East Khasi Hills

Family Type	Mawpat	Mawsynram	East Khasi Hills(2 Blocks)
Nuclear	108 (35.88%)	114 (37.87%)	222 (73.75%)
Nuclear Extended	14 (4.65%)	7 (2.32%)	21 (6.97%)
Joint	23 (7.64%)	23 (7.64%)	46 (15.28%)
Joint Extended	3 (0.99%)	6 (1.99%)	9 (2.99%)
Broken/ Incomplete	2 (0.66%)	1 (0.33%)	3 (0.99%)
Total	150 (49.83%)	151 (50.17%)	301 (100%)

The data on family types in Mawpat and Mawsynram, two blocks in East Khasi Hills, reflects a predominance of nuclear family structures in both areas. Out of a total of 301 households surveyed, nearly equal proportions were recorded from Mawpat (49.83%) and Mawsynram

(50.17%). Nuclear families constitute the overwhelming majority, accounting for 73.75% of all households, with Mawpat reporting 35.88% and Mawsynram 37.87%. This suggests a strong trend toward smaller, independent family units, possibly influenced by urbanization, economic factors, or changing social norms. Nuclear extended families represent a small share at 6.97%, slightly more common in Mawpat (4.65%) than in Mawsynram (2.32%). Joint families, which traditionally indicate a multi-generational household structure, account for 15.28% of the total, equally distributed between the two regions at 7.64% each. Joint extended families are even less common, making up just 2.99%, with Mawsynram (1.99%) slightly higher than Mawpat (0.99%). Finally, broken or incomplete families—those where a member, typically a parent, is missing—constitute the smallest category at just 0.99%. This overall distribution highlights the predominance of nuclear family systems in both blocks, with joint and extended forms becoming increasingly rare, reflecting broader socio-cultural shifts in family organization within East Khasi Hills.

Table 20: Description of Family Assets of the Studied Households of Mawpat and Mawsynram Block of East Khasi Hills

House			
House Possession	**Mawpat**	**Mawsynram**	**East Khasi Hills (2 Blocks)**
Own House	102 (33.89%)	99 (32.89%)	201 (66.78%)
Rented House	48 (15.95%)	52 (17.28%)	100 (33.22%)
Total	150 (49.83%)	151 (50.17%)	301 (100%)
Agricultural Land			
Land (in acres)	**Mawpat**	**Mawsynram**	**East Khasi Hills (2 Blocks)**
0 – 3	145 (48.17%)	144 (47.84%)	289 (96.01%)
3 – 6	5 (1.66%)	5 (1.66%)	10 (3.32%)
6 and above	0	2 (0.66%)	2 (0.66%)
Total	150 (49.83%)	151 (50.17%)	301 (100%)
Motor Vehicles			
Vehicles	**Mawpat**	**Mawsynram**	**East Khasi Hills (2 Blocks)**
Bike	18 (5.98%)	16 (5.32%)	34 (11.30%)
Car	21 (6.98%)	18 (5.98%)	39 (12.96%)
Bike and Car	9 (2.99%)	6 (1.99%)	15 (4.98%)
No Vehicle	102 (33.89%)	111 (36.88%)	213 (70.76%)
Total	150 (49.83%)	151 (50.17%)	301 (100%)
Households Having Cattle			

Cattle	Mawpat	Mawsynram	East Khasi Hills (2 Blocks)
Yes	25 (8.31%)	25 (8.31%)	50 (16.61%)
No	125 (41.53%)	126 (41.86%)	251 (83.39%)
Total	150 (49.83%)	151 (50.17%)	301 (100%)

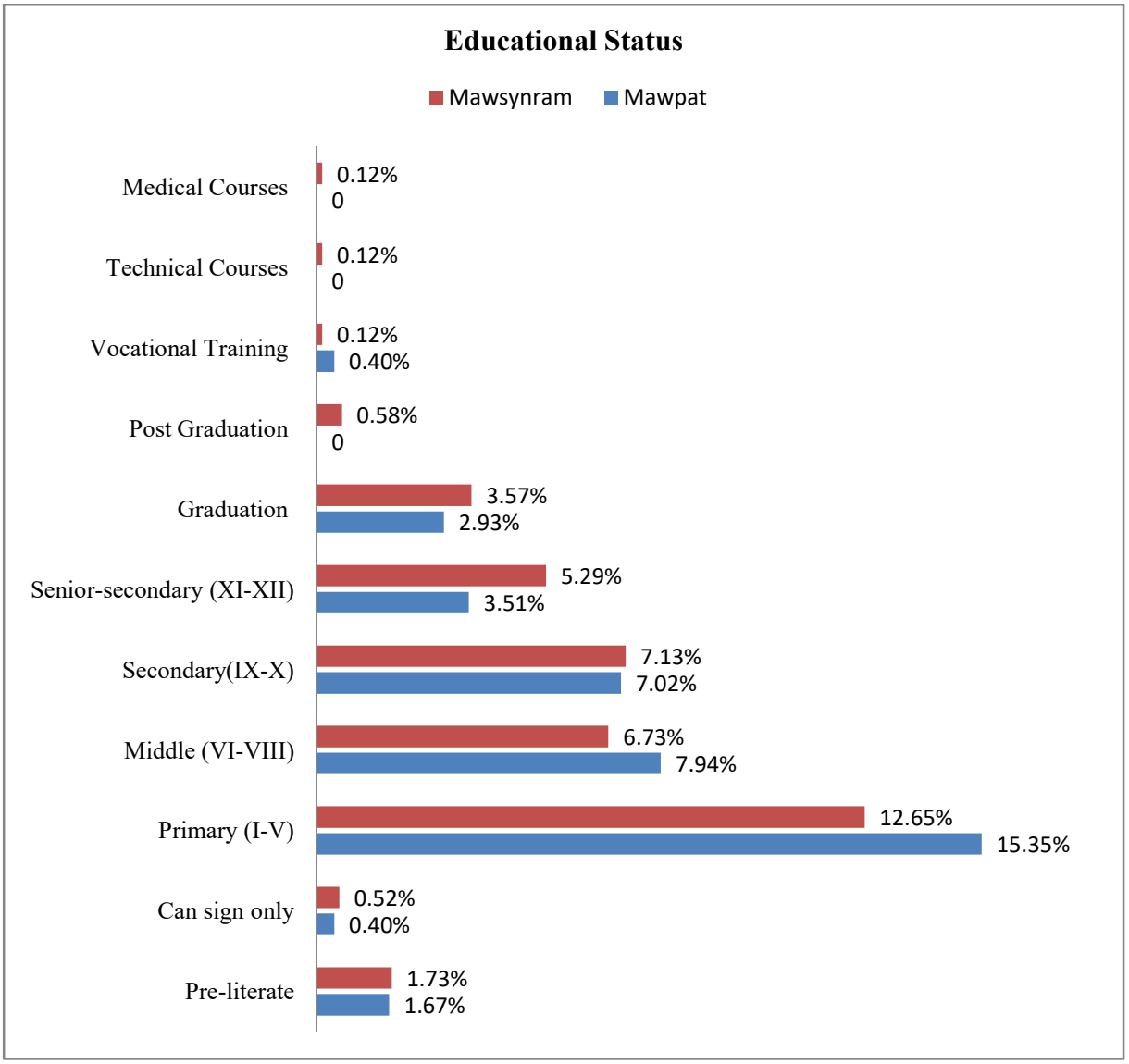
The above table represents the family assets of the studied households of the Mawpat and Mawsynram block of East Khasi Hills. In Mawpat block, 33.89% of households have their own house while 15.95% of households have rented house. From the table it can be understood the majority of households that is 48.17% have 0-3 acres of land and only 1.66% have 3-6 acres of land. In case of motor vehicles higher percentage of the households have no motor vehicles (33.89%) while only 15.95% of households either have bike, car or both. With respect to rearing cattle, in Mawpat block, 41.53% of households have no cattle while only 8.31% of household have cattle. Again, in Mawsynram block, 32.89% of households have own house whereas, 17.28% have rented house. With respect to agricultural land, 47.84% of households have 0-3 acres of land, 1.66% have 3-6 acres of land while only 0.66% have land 6 acres and above. Meanwhile, 36.88% of households have no motor vehicle, whereas only 13.29% of households have bike, car or both. Also, 41.86% households in Mawsynram block have no cattle but only 8.31% households have cattle.

Table 21: Educational Status of the studied population in the East Khasi Hills

Educational Status	Mawpat	Mawsynram	East Khasi Hills
Pre-literate	29 (1.67%)	30 (1.73%)	59 (3.39%)
Can sign only	7 (0.40%)	9 (0.52%)	16 (0.92%)
Primary (I-V)	267 (15.35%)	220 (12.65%)	487 (28.01%)
Middle (VI-VIII)	138 (7.94%)	117 (6.73%)	255 (14.66%)
Secondary(IX-X)	122 (7.02%)	124 (7.13%)	246 (14.15%)
Senior-secondary (XI-XII)	61 (3.51%)	92 (5.29%)	153 (8.80%)
Graduation	51 (2.93%)	62 (3.57%)	113 (6.50%)
Post Graduation	0	10 (0.58%)	10 (0.58%)
Vocational Training	7 (0.40%)	2 (0.12%)	9 (0.52%)

Technical Courses	0	2 (0.12%)	2 (0.12%)
Medical Courses	0	2 (0.12%)	2 (0.12%)
Total	672 (38.64%)	767 (44.11%)	1739 (100%)

Fig 8: Educational Status of the Studied Population of Mawpat and Mawsynram Block of East Khasi Hills



The above table represented the educational status of the studied population of both Mawpat and Mawsynram blocks. The table depicted that primary education is the most common level of education attained, with 267 individuals (15.35%) from Mawpat and 220 (12.65%) from Mawsynram. This is followed by middle education, with 138 individuals (7.94%) from Mawpat and 124 (7.13%) from Mawsynram. Secondary education is represented by 122 individuals (7.02%) from Mawpat and 117 individuals (6.73%) from Mawsynram, while senior-secondary is represented by 61 (3.51%) and 92 (5.29%) individuals respectively. In terms of higher education, graduation includes 51 individuals (2.93%) from Mawpat and 62 (3.57%) from Mawsynram. The pre-literate group consists of 29 individuals (1.67%) from Mawpat and 30 (1.73%) from Mawsynram. But only a few individuals who can only sign are higher from Mawsynram (9; 0.52%) compared to Mawpat (7; 0.40%). Moreover, 10 individuals (0.58%) from Mawsynram block attained post graduation which was not reported from Mawpat block. But, individuals from Mawpat block were reported to attained any vocational degrees (7;0.40%) which is higher than Mawsynram block (2;0.12%). Also, equal number of individuals from Mawsynram block was found to have technical and medical degrees (2; 0.12%), which was not reported from Mawpat block. Overall, Mawpat contributes 672 individuals (38.64%) and Mawsynram contributes 767 individuals (44.11%) to the total surveyed population. The data suggests that Mawsynram Block has a relatively higher representation in the upper levels of education compared to Mawpat.

Table 22: Educational Index of the Studied Population Based on Household

Variables	Mawpat	Mawsynram	East Khasi Hills (2 Blocks)
Poor (0-5)	6 (1.99%)	57 (18.94%)	63 (20.93%)
Satisfactory (6-10)	51 (16.94%)	75 (24.92%)	126 (41.86%)
Above Average (11-15)	13 (4.32%)	17 (5.65%)	30 (9.97%)
High (16 and above)	0	2 (0.66%)	2 (0.66%)
Total	150 (49.83%)	151 (50.17%)	301 (100%)

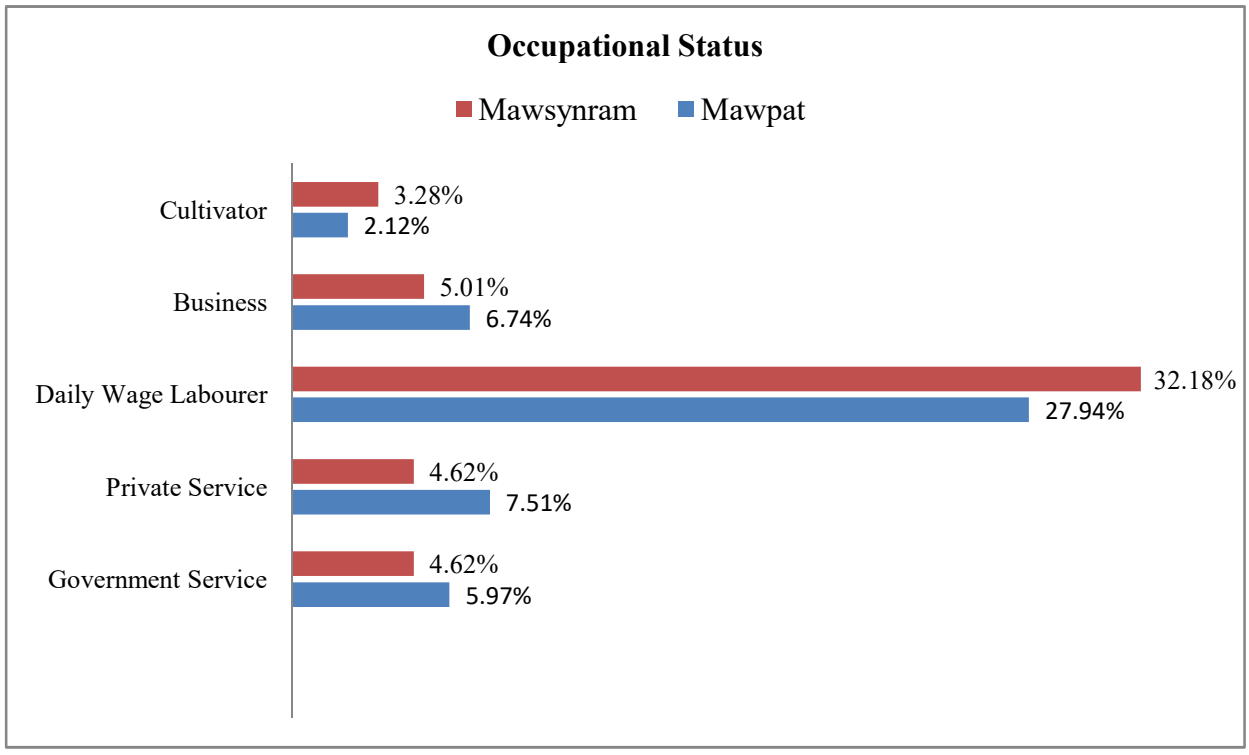
The above table illustrates the educational index of the studied households of Mawpat and Mawsynram block of East Khasi Hills District of Meghalaya. The households of both the block were studied on the basis of poor,satisfactory, above average and high based on their educational status. The highest percentages of households were reported to have satifactory educational status with 16.94% from Mawpat block and 24.92% from Mawsynram block followed by 4.32% households from Mawpat block and 5.65% households from Mawsynram block were identified

as above average in their educational status. While, 6 families (1.99%) from Mawpat block and 57 families (18.94%) from Mawsynram block were categorized as poor in their educational status. Moreover, only 2 families (0.66%) from Mawsynram block were reported to have high educational status whereas, no family from Mawpat block was reported in that category.

Table 23: Occupational Status of the studied population in the East Khasi Hills

Occupational Status	**Mawpat**	**Mawsynram**	**East Khasi Hills (2 Blocks)**
Government Service	31 (5.97%)	24 (4.62%)	55 (10.60%)
Private Service	39 (7.51%)	24 (4.62%)	63 (12.14%)
Daily Wage Labourer	145 (27.94%)	167 (32.18%)	312 (60.12%)
Business	35 (6.74%)	26 (5.01%)	61 (11.75%)
Cultivator	11 (2.12%)	17 (3.28%)	28 (5.39%)
Total	261 (50.29%)	258 (49.71%)	519 (100%)

Fig 9: Occupational Status of the Studied Population of Mawpat and Mawsynram Block of East Khasi Hills



The occupational status of Mawpat showed that only 2.12% of participants were cultivators and 6.74% were engaged in business. 27.94% of individuals were engaged in daily wage labour. In Mawsynram block, 3.28% were cultivators, higher than Mawpat block. While, only 5.01% were engaged in some sort of businesses which was lower than Mawpat block. Daily wage labour from Mawsynram block was reported as 32.18%. Moreover, 7.51% from Mawpat block and 4.62% from Mawsynram block were reported to engage in private services. Whereas, 5.97% from Mawpat block and 4.62% from Mawsynram block were engaged in governmental services.

Table 24: Monthly Income of the Studied Households of Mawpat and Mawsynram Block of East Khasi Hills

Category (in Rupees)	Mawpat	Mawsynram	East Khasi Hills (2 Blocks)
0-25000	115 (38.21%)	119 (39.53%)	234 (77.74%)
25001-50000	29 (9.63%)	18 (5.98%)	47 (15.61%)
50001-75000	5 (1.66%)	4 (1.33%)	9 (2.99%)
75001-100000	1 (0.33%)	4 (1.33%)	5 (1.66%)
100001-125000	0	1 (0.33%)	1 (0.33%)
125001 and Above	0	5 (1.66%)	5 (1.66%)
Total	150 (49.83%)	151 (50.17%)	301 (100%)

The above table shows the monthly income of the studied households of Mawpat and Mawsynram blocks of East Khasi Hills District. From the table it is clearly understood that, maximum percentages of families that is 38.21% from Mawpat and 39.53% families from Mawsynram had a monthly income up to rupees 25,000. 29 families (9.63%) from Mawpat block and 18 families (5.98%) from Mawsynram block had a monthly income from rupees 25,001 – 50,000. Also, in the income category of rupees 50,001 – 75,000, 5 families (1.66%) from Mawpat block and 4 families (1.33%) from Mawsynram block were reported. And, 0.33% families from Mawpat block and 1.33% families from Mawsynram block were reported to fall under the monthly income category of 75,001 – 1,00,000. However, families under the income group of rupees100001-125000 and 125001 or more were reported only from Mawsynram block having a percentage of 0.33% and 1.66% respectively.

Table 25: Monthly Per-capita Income of the Studied Households of Mawpat and Mawsynram Block of East Khasi Hills

Category (in Rupees)	Mawpat	Mawsynram	East Khasi Hills (2 Blocks)
0-5000	123 (40.86%)	123 (40.86%)	246 (81.73%)

5001-10000	22 (7.31%)	17 (5.65%)	39 (12.96%)
10001-15000	4 (1.33%)	2 (0.66%)	6 (1.99%)
15001-20000	1 (0.33%)	5 (1.66%)	6 (1.99%)
20001-25000	0	1 (0.33%)	1 (0.33%)
25001 and Above	0	3 (0.99%)	3 (0.99%)
Total	150 (49.83%)	151 (50.17%)	301 (100%)

The above table represents the monthly per – capita income of the studied households of Mawpat and Mawsynram block of East Khasi Hills District of Meghalaya. The monthly per – capita income of the studied households were divided into the following categories – 0 – 5,000, 5,001 – 10,000, 10,001 – 15,000, 15,001 – 20,000, 20,001 – 25,000 and 25,001 and above respectively. Highest percentage of participants from both Mawpat (40.86%) and Mawsynram block (40.86%) were reported to have per – capita monthly income up to rupees 5,000. While, 22 families (7.31%) from Mawpat block and 17 families (5.65%) from Mawsynram block were reported under the monthly per – capita income category of rupees 5,001 – 10,000. Also, 4 families (1.33%) from Mawpat block and 2 families (0.66%) from Mawsynram block were reported under the monthly per – capita income category of rupees 10,001 – 15,000. Also, 1 (0.33%) family from Mawpat block and 5 families (1.66%) were reported under the monthly per – capita income category of rupees15,001-20,000 respectively. Moreover, under the monthly per – capita income categories of 20,001 – 25,000 and 25,000 or more, families were reported only from Mawsynram block with percentages of 0.33%and 0.99% respectively.

Table 26: Annual Income of the studied households of Mawpat and Mawsynram Block of East Khasi Hills

Category (in Rupees)	Mawpat	Mawsynram	East Khasi (2 Blocks)
0-300000	115 (38.21%)	120 (39.87%)	235 (78.07%)
300001-600000	29 (9.63%)	17 (5.65%)	46 (15.28%)
600001-900000	5 (1.66%)	4 (1.33%)	9 (2.99%)
900001-1200000	1 (0.33%)	4 (1.33%)	5 (1.66%)
1200001-1500000	0	1 (0.33%)	1 (0.33%)
1500001 and Above	0	5 (1.66%)	5 (1.66%)
Total	150 (49.83%)	151 (50.17%)	301 (301%)

The above table shows the annual income of the studied households of Mawpat and Mawsynram blocks of East Khasi Hills District. From the table it is clearly understood that, maximum percentages of families that is 38.21% from Mawpat block and 39.87% from Mawsynram block had an annual income up to rupees 3,00,000. 29 families (9.63%) from Mawpat block and 17

families (5.65%) from Mawsynram block had an annual income from rupees 3,00,001 – 6,00,000. Also, in the annual income category of rupees 6,00,001 – 9,00,000, 5 families (1.66%) from Mawpat block and 4 families (1.33%) from Mawsynram block were reported. And under the annual income category of rupees 9,00,001-12,00,000 1 (0.33%) family from Mawpat block and 4 (1.33%) families from Mawsynram block was reported. However, families under the annual income group of rupees 12,00,001 – 15,00,000 and 1500001 or more were reported only from Mawsynram block having a percentage of 0.33% and 1.66% respectively.

Table 27: Annual Per-capita Income of the Studied Households of Mawpat and Mawsynram Block of East Khasi Hills

Category (in Rupees)	Mawpat	Mawsynram	East Khasi Hills (2 Blocks)
0-25000	45 (14.95%)	56 (18.60%)	101 (33.55%)
25001-50000	59 (19.60%)	52 (17.28%)	111 (36.88%)
50001-75000	31 (10.30%)	20 (6.64%)	51 (16.94%)
75001-100000	8 (2.66%)	9 (2.99%)	17 (5.65%)
100001-125000	6 (1.99%)	4 (1.33%)	10 (3.32%)
125001-150000	0	1 (0.33%)	1 (0.33%)
150001-175000	0	0	0
175001-200000	1 (0.33%)	2 (0.66%)	3 (0.99%)
200001 and above	0	7 (2.33%)	7 (2.33%)
Total	150 (49.83%)	151 (50.17%)	301 (100%)

The above table represents the annual per – capita income of the studied households of Mawpat and Mawsynram block of East Khasi Hills District of Meghalaya. The annual per – capita income of the studied households were divided into the following categories: 0 – 25,000, 25,001 – 50,000, 50,001 – 75,000, 75,001 – 1,00,000, 1,00,001 – 1,25,000 and 125,001 – 1,50,000, 1,50,001 – 1,75,000, 1,75,001 – 2,00,000 and 2,00,001 and above respectively. Highest percentage of families from Mawpat block (19.60%) were reported under the annual per – capita income category of rupees 25001 – 50000 whereas, highest percentage of families from Mawsynram block (18.60%) were reported to have per – capita annual income up to rupees 25,000. While, 31 families (10.30%) from Mawsynram block and 20 families (6.64%) from Mawsynram block were reported under the annual per – capita income category of rupees 50,001 – 75,000. Also, 2.66% families from Mawpat block were reported under the annual per – capita income category of rupees 75,001 – 1,00,000 which is quite less than the annual per – capita income of Ri-Muliang block in that category. However, 6 families (1.99%) from Mawpat block and 4 (1.33%) families from Mawsynram block were reported under the annual per – capita income category of 1,00,001 – 1,25,000. But 0.33% family from Mawsynram block was reported under the annual per – capita income category of 1,25,001-1,50,000while no families from Mawpat block were reported in this category. Interestingly, no families, neither from Mawpat

block nor from Mawsynram block were reported under the annual per – capita income category of 1,50,001-1,75,000. But 0.99% families from both Mawpat and Mawsynram blocks were reported under the annual per – capita income category of 1,75,001-2,00,000. Moreover, only 7 families (2.33%) belonged the annual per – capita income group of 2,00,001 and above which was reported from Mawsynram block.

Table 28: Economic Index of the Studied Population Based on Household

Variables	Mawpat	Mawsynram	East Khasi Hills (2 Blocks)
Poor (0-2)	69 (22.92%)	42 (13.95%)	111 (36.88%)
Satisfactory (3-5)	64 (21.26%)	67 (22.26%)	131 (43.52%)
Above Average (6-8)	13 (4.32%)	26 (8.64%)	39 (12.96%)
High (9 and above)	4 (1.33%)	16 (5.32%)	20 (6.64%)
Total	150 (49.83%)	151 (50.17%)	301 (100%)

The above table illustrates the economic index of the studied households of Mawpat and Mawsynram block of East Khasi Hills District of Meghalaya. The households of both the block were studied on the basis of poor, satisfactory, above average and high based on their economic status. The highest percentages of households were reported to have poor and satisfactory economic status with 22.92% from Mawpat block and 22.26% from Mawsynram block followed by 21.26% households from Mawpat block and 13.95% households from Mawsynram block were identified as satisfactory and poor in their economic status respectively. While, 13 families (4.32%) fromMawpat block and 26 families (8.64%) from Mawsynram block were categorized as above average in their economic status. Moreover, only 4 families (1.33%) from Mawpat block and 16 families (5.32%) from Mawsynram block were reported to have high economic status.

Table 29: Health Insurance Coverage of the Studied Household of Mawpat and Mawsynram block of East Khasi Hills District

Health Insurance Coverage	Mawpat	Mawsynram	East Khasi Hills (2 Blocks)
Yes	128 (42.52%)	115 (38.21%)	243 (80.73%)
No	22 (7.31%)	36 (11.96%)	38 (12.62%)
Total	150 (49.83%)	151 (50.17%)	301 (100%)

The above table demonstrated the health insurance coverage of the studied population of Mawpatand Mawsynram block of East Khasi Hills District. Here, it was found that 'Megha Health Insurance Scheme' (MHIS) was implemented in the convergence with the RashtriyaSwasthya Yojana (RSBY). This insurance coverage is from 1.6 lakhs – 5.3 lakhs for all citizens of the Meghalaya state.

The table showed that out of 301 households from both the 42.52% of households from Mawpat block and 38.21% of households from Mawsynram block were covered under the MHIS scheme. Whereas, 7.31% households from Mawpat block and 11.96% households from Mawsynram block were not covered under MHIS scheme.

Chapter 2

Assessment of Community and Personal Hygienic Practices and Addiction Behaviour among the Mothers of the Khasi Community

Hygiene is a condition and practices that help people to prevent the spread of the diseases and promote better health and well – being of the population. Hygienic practices include frequent washing of hands, face, clothes, food hygiene, water purifying and bathing with soap (Brahmanandan and Nagrajan, 2021). Practicing hygiene is difficult without potable water and proper sanitation. Lack of potable water and proper sanitation facility, poor hygienic practices is one of the major causes of diarrhea among children below five years of age in developing countries (Bassani *et al*., 2010). Hygiene practices are ever considered as one of the significant factors to ensure healthy leaving and well – being, especially in prevention of communicable diseases.

Part A: Assessment of community or household hygienic practices of Mawpat and Mawsynram block

Table 30: House Type and Housing Pattern of Mawpatand Mawsynram block of East Khasi Hills District

Type of House	**Mawpat**	**Mawsynram**	**East Khasi Hills (2 Blocks)**
Kaccha	19 (6.31%)	17 (5.65%)	36 (11.96%)
Semi-Pucca	77 (25.58%)	50 (33.11%)	127 (42.19%)
Pucca	54 (17.94%)	84 (27.91%)	138 (45.85%)
Total	150 (49.83%)	151 (50.17%)	301 (100%)
Predominant material of the Roof	**Mawpat**	**Mawsynram**	**East Khasi Hills (2 Blocks)**
Grass thatched/Bamboo/Wood/Mud	2 (0.66%)	2 (0.66%)	4 (1.33%)
GI Metal/Asbestos sheets/Tin	92 (30.56%)	83 (27.57%)	175 (58.14%)
Concrete	56 (18.60%)	66 (21.93%)	122 (40.53%)
Total	150 (49.83%)	151 (50.17%)	301 (100%)
Predominant material of the Floor	**Mawpat**	**Mawsynram**	**East Khasi Hills (2 Blocks)**
Mud	1 (0.33%)	2 (0.66%)	3 (0.99%)
Wood/Bamboo	14 (4.65%)	4 (1.33%)	18 (5.98%)
Bricks/Stone	123 (40.86%)	23 (7.64%)	146 (48.50%)
Mosaic floor/Tiles/Marble	12 (3.99%)	122 (40.53%)	134 (44.52%)

Total	150 (49.83%)	151 (50.17%)	301 (100%)
Source of Light	**Mawpat**	**Mawsynram**	**East Khasi Hills (2 Blocks)**
No Light	0	1 (0.33%)	1 (0.33%)
Electricity	150 (49.83%)	150 (49.83%)	300 (99.67%)
Total	150 (49.83%)	151 (50.17%)	301 (100%)

The table presents data on house types and housing patterns in Mawpat and Mawsynram blocks of the East Khasi Hills District, Meghalaya. Overall, *pucca* houses accounted for the highest proportion (45.85%), followed by *semi-pucca* (42.19%) and *kaccha* houses (11.96%). Among the two blocks, Mawsynram had a higher share of *pucca* houses (27.91%) compared to Mawpat (17.94%). A similar pattern was observed for *semi-pucca* houses, with Mawsynram reporting 33.11% and Mawpat 25.58%.The housing profile of Mawpat and Mawsynram blocks indicates an encouraging trend toward permanent housing structures, with nearly 88% of houses being either *pucca* or *semi-pucca*. Mawsynram, a region often associated with extreme rainfall and challenging terrain, shows better housing quality than Mawpat.

Regarding roofing materials, GI metal, asbestos sheets, and tin were the most commonly used (58.14%), followed by concrete roofs (40.53%). For flooring, brick or stone was the most prevalent material (48.50%), particularly in Mawpat. Mosaic, tiles, or marble floors were also notable (44.52%), with Mawsynram showing a significantly higher proportion (40.53%) than Mawpat (3.99%). The dominance of GI/tin roofing suggests a preference for durable, water-resistant materials suited to the local climate. The widespread use of brick and stone for flooring in Mawpat, along with the prevalence of mosaic/tile/marble floors in Mawsynram, highlights variability in material accessibility or aesthetic preferences. Nearly all houses had access to electricity, except for one household in Mawsynram.

Table 31: Cleanliness of the Householdsof Mawpat and Mawsynram block of East Khasi Hills District

Frequency of Cleaning Rooms	**Mawpat**	**Mawsynram**	**East Khasi Hills (2 Blocks)**
Once in a week	3 (0.99%)	4 (1.33%)	7 (2.33%)
2-3 day in a week	24 (7.97%)	38 (12.62%)	62 (20.60%)
Daily	123 (40.86%)	109 (36.21%)	232 (77.08%)
Total	150 (49.83%)	151 (50.17%)	301 (100%)
Method of Cleaning	**Mawpat**	**Mawsynram**	**East Khasi Hills (2 Blocks)**
Dry mopping	6 (1.99%)	7 (2.33%)	13 (4.32%)
Mopping with plain water	68 (22.59%)	90 (29.90%)	158 (52.49%)
Mopping with disinfectant	76 (25.25%)	54 (17.94%)	130 (43.19%)

Total	150 (49.83%)	151 (50.17%)	301 (100%)

The table presents data on household cleanliness practices in the Mawpat and Mawsynram blocks of East Khasi Hills District, Meghalaya. A majority of households (77.08%) reported cleaning their houses daily—comprising 40.86% from Mawpat and 36.21% from Mawsynram. About 20.60% of households across both blocks reported cleaning 2–3 times per week, with 7.97% from Mawpat and 12.62% from Mawsynram. Only 2.33% of households cleaned their homes once a week.The finding reflects a strong emphasis on daily household cleanliness among the studied communities, with over three-fourths of households maintaining a daily cleaning routine. This suggests a culturally ingrained value placed on hygiene, possibly influenced by environmental conditions and health awareness.

Regarding the method of cleaning, mopping with plain water was the most common practice (52.49%), with Mawpat accounting for 22.59% and Mawsynram 29.90% of such households. Additionally, 43.19% of households used disinfectants while mopping, with a higher proportion in Mawpat (25.25%) compared to Mawsynram (17.94%).While mopping with plain water remains the dominant cleaning method, a substantial proportion (over 40%) of households incorporate disinfectants, indicating growing awareness of sanitation and disease prevention. Interestingly, Mawpat households are more likely to use disinfectants, potentially reflecting better access to cleaning products or higher health consciousness.

Table 32: Cooking Practicesof the households of Mawpat and Mawsynram block of East Khasi Hills District

Cooking Place/ Kitchen	**Mawpat**	**Mawsynram**	**East Khasi Hills (2 Blocks)**
Cooking inside a room	59 (19.60%)	50 (16.61%)	109 (36.21%)
Outdoor	1 (0.33%)	1 (0.33%)	2 (0.66%)
Separate Kitchen	90 (29.90%)	100 (33.22%)	190 (63.12%)
Total	150 (49.83%)	151 (50.17%)	301 (100%)
Mode of Cooking	**Mawpat**	**Mawsynram**	**East Khasi Hills (2 Blocks)**
Open fire (temporary)	11 (3.65%)	34 (11.30%)	45 (14.95%)
Earthen chullah / Traditional Hearth	30 (9.97)	33 (10.96%)	63 (20.93%)
Electric Oven	7 (2.33%)	7 (2.33%)	14 (4.65%)
LPG	84 (27.91%)	49 (16.28%)	133 (44.19%)
Open fire and/ or LPG	6 (1.99%)	8 (2.66%)	14(4.65%)
Earthen Chullahand /or LPG	7 (2.33%)	17 (5.65%)	24 (7.97%)
Kerosene Stove	0	1 (0.33%)	1 (0.33%)
Wood or Electric Oven	5 (1.66%)	2 (0.66%)	7 (2.33%)

Total	150 (49.83%)	151 (50.17%)	301 (100%)
Utensils used for Cooking	**Mawpat**	**Mawsynram**	**East Khasi Hills (2 Blocks)**
Earthen pot	17 (5.65%)	6 (1.99%)	23 (7.64%)
Metallic (Aluminium/Steel/Iron pot)	133 (44.19%)	145 (48.17%)	278 (92.36%)
Total	150 (49.83%)	151 (50.17%)	301 (100%)
Material used for Cleaning of Utensils	**Mawpat**	**Mawsynram**	**East Khasi Hills (2 Blocks)**
Ash	2 (0.66%)	2 (0.66%)	4 (1.33%)
Chemicals (Soap/Detergent)	148 (49.17%)	149 (49.50%)	297 (98.67%)
Total	150 (49.83%)	151 (50.17%)	301 (100%)

The table illustrates the cooking practices of households in the Mawpat and Mawsynram blocks of East Khasi Hills District, Meghalaya. A majority of households (63.12%) had a separate kitchen, with 29.90% from Mawpat and 33.22% from Mawsynram. However, a significant proportion (36.21%) cooked inside the living room, with Mawpat (19.60%) reporting a slightly higher prevalence than Mawsynram (16.61%). Only two households—one from each block—reported cooking outdoors. The cooking pattern data reveals a gradual shift towards modern practices while retaining elements of tradition. The widespread use of separate kitchens (63.12%) indicates improving household infrastructure.

Regarding the mode of cooking, LPG was the most commonly used fuel source (44.19%), followed by traditional earthen chullahs (20.93%). Additionally, 14.95% of households used open fire, while 7.97% reported using either LPG or earthen chullahs interchangeably based on convenience. A smaller group (4.65%) used a combination of open fire and LPG. LPG is now the most common cooking fuel, reflecting improved access to cleaner energy. Yet, the continued use of earthen chullahs and open fire—either as the primary or secondary mode—signals persistent traditional habits or economic constraints.

Most households (92.36%) used metallic utensils (aluminium, steel, or iron), with slightly higher usage in Mawsynram (48.17%) than in Mawpat (44.19%). A minority (7.64%) still relied on traditional earthen pots, comprising 5.65% from Mawpat and 1.99% from Mawsynram.

Nearly all households (98.67%) used soap or detergent for cleaning utensils, with an almost equal distribution between Mawpat (49.17%) and Mawsynram (49.50%). The overwhelming use of metallic utensils (over 92%) and near-universal use of soap or detergent for cleaning highlight a strong inclination toward hygienic cooking practices. The use of earthen pots, although

declining, suggests that cultural preferences still influence cooking behaviors in some households.

Table 33: Treatment of Household waterof Mawpat and Mawsynram block of East Khasi Hills District

Source of water for household use	**Mawpat**	**Mawsynram**	**East Khasi Hills (2 Blocks)**
Pond/Stream/River	14 (4.65%)	22 (7.31%)	36 (11.96%)
Well/ Tubewell	1 (0.33%)	23 (7.64%)	24 (7.97%)
Piped/ Tap water	61 (20.27%)	106 (35.22%)	167 (55.48%)
Purchased	74 (24.58%)	0	74 (24.58%)
Total	150 (49.83%)	151 (50.17%)	301 (100%)
Source of Drinking Water	**Mawpat**	**Mawsynram**	**East Khasi Hills (2 Blocks)**
Pond/Stream/River	4 (1.33%)	15 (4.98%)	19 (6.31%)
Well/ Tubewell	1 (0.33%)	16 (5.32%)	17 (5.65%)
Piped/ Tap water	55 (18.27%)	120 (39.87%)	175 (58.14%)
Purchased	90 (29.90%)	0	90 (29.90%)
Total	150 (49.83%)	151 (50.17%)	301 (100%)
Purification of Drinking water	**Mawpat**	**Mawsynram**	**East Khasi Hills (2 Blocks)**
No	2 (0.66%)	0	2 (0.66%)
Yes	148 (49.17%)	151 (50.17%)	299 (99.34%)
Total	150 (49.83%)	151 (50.17%)	301 (100%)
Purification Method	**Mawpat**	**Mawsynram**	**East Khasi Hills (2 Blocks)**
Boil	134 (44.97%)	129 (43.29%)	263 (88.26%)
Use water filter	4 (1.34%)	21 (7.05%)	25 (8.39%)
Use electronic purifier	10 (3.36%)	1 (0.33%)	10 (3.36%)
Total	148 (49.66%)	151 (50.67%)	298 (100%)
Frequency of Cleaning water storage	**Mawpat**	**Mawsynram**	**East Khasi Hills (2 Blocks)**
Sometimes	2 (0.66%)	11 (3.65%)	13 (4.32%)
When dirty	1 (0.33%)	0	1 (0.33%)
Fortnightly	9 (2.99%)	1 (0.33%)	10 (3.32%)
Once in a week	65 (21.60%)	62 (20.60%)	127 (42.19%)
2-3 day in a week	51 (16.94%)	65 (21.60%)	116 (38.54%)
Daily	22 (7.31%)	12 (3.99%)	34 (11.30%)
Total	150 (49.83%)	151 (50.67%)	301 (100%)

The table outlines household water treatment practices in the Mawpat and Mawsynram blocks of East Khasi Hills District, Meghalaya. Several variables were considered to assess water quality, including the source of household water, source of drinking water, purification practices, and frequency of cleaning water storage containers.

A majority of households in both blocks rely on piped/tap water for household use, with Mawsynram reporting a higher proportion (35.22%) compared to Mawpat (20.27%). About 11.96% of households used natural sources such as ponds, streams, or rivers, again with Mawsynram (7.31%) showing higher usage than Mawpat (4.65%). Notably, 24.58% of households in Mawpat reported purchasing water for domestic use, a practice not observed in Mawsynram.

For drinking water, piped/tap water was also the most common source (58.14%), particularly in Mawsynram (39.87%). However, 29.90% of households—exclusively from Mawpat—depended on purchased drinking water. Alarmingly, 5.65% and 6.31% of households relied on wells (tube wells) and natural sources (ponds/streams/rivers), respectively. In both cases, Mawsynram had higher frequencies (15 and 16 households) compared to Mawpat (4 and 1 households, respectively).

Nearly all households (99.34%) reported purifying their drinking water, with only two exceptions in Mawpat. The most common method of purification was boiling (88.26%), with similar representation from both blocks—Mawpat (44.97%) and Mawsynram (43.29%). Only 25 households, mostly from Mawsynram (21), used non-electrical water filters, and just 10 households reported using electrical water purifiers.

Regarding the frequency of cleaning water storage, only 34 out of 301 households cleaned their storage containers daily. The majority (42.19%) cleaned them weekly, followed by 38.54% who did so 2–3 times per week. A smaller proportion cleaned storage on a fortnightly basis (3.32%) or at irregular intervals (4.32%).

The findings point to an encouraging level of awareness regarding water purification, with almost universal adoption—primarily through boiling. However, reliance on untreated natural water sources by a small but notable proportion of households—particularly in Mawsynram—raises health concerns. The exclusive dependence on purchased water in Mawpat suggests localized water scarcity or quality issues that warrant attention.
The higher use of non-conventional water sources in Mawsynram could be influenced by geographic constraints or limited infrastructure. Similarly, the low adoption of water purifiers (especially electrical) indicates financial or accessibility barriers, despite a growing recognition of water safety.

Storage hygiene, while moderately practiced, shows room for improvement. Only a small fraction of households clean their containers daily, which could affect the overall safety of drinking water regardless of its source or treatment.

Table 34: Sanitation Status of the studied populationof Mawpat and Mawsynram block of East Khasi Hills District

Disposal of household Garbage	**Mawpat**	**Mawsynram**	**East Khasi Hills (2 Blocks)**
Disposed off within household yard or plot	2 (0.66%)	3 (0.99%)	5 (1.66%)
Buried or burned	28 (9.30%)	86 (28.57%)	114 (37.87%)
Collected by local civic body/ Collected by local NGOs	120 (39.87%)	62 (20.60%)	182 (60.47%)
Total	150 (49.83%)	151 (50.17%)	301 (100%)
Drainage facility	**Mawpat**	**Mawsynram**	**East Khasi Hills (2 Blocks)**
No drainage	12 (3.99%)	4 (1.33%)	16 (5.32%)
Kaccha	71 (23.59%)	71 (23.59%)	142 (47.18%)
Pucca	67 (22.26%)	76 (25.25%)	143 (47.51%)
Total	150 (49.83%)	151 (50.17%)	301 (100%)

The table presents the sanitation status of the studied population in the Mawpat and Mawsynram blocks of East Khasi Hills district. Sanitation was assessed based on two main indicators: disposal method of household garbage and availability of drainage facilities.

A significant proportion of households reported that their garbage was collected by the local civic body. Mawpat reported a notably higher percentage (39.87%) in this regard compared to Mawsynram (20.60%). This may reflect better municipal service coverage or stronger civic infrastructure in Mawpat.

Interestingly, 37.87% of households across both blocks disposed of their garbage by burying or burning it, a practice more prevalent in Mawsynram (28.57%) than in Mawpat (9.30%). This suggests that in areas where formal garbage collection is less accessible, households tend to resort to traditional or self-managed waste disposal methods. Only a small fraction (1.66%) of households reported disposing of garbage within their household yard or plot, indicating that indiscriminate disposal is relatively rare.

Regarding drainage facilities, a high percentage of households (94.68%) reported having some form of drainage—either kachha (earthen/unlined) or pucca (concrete/lined). The distribution of kachha and pucca drainage facilities was nearly equal between the two blocks, with 47.18% and 47.51% respectively. Notably, Mawsynram exhibited a slightly higher presence of pucca

drainage (25.25%) compared to Mawpat (22.26%), which may suggest relatively better investment in durable infrastructure in certain pockets of Mawsynram.
Overall, the findings indicate disparities in the provision and type of sanitation infrastructure across the two blocks. While Mawpat appears to benefit more from formal waste collection services, Mawsynram shows a slight advantage in terms of concrete drainage systems. These differences could be influenced by geographical, administrative, or socio-economic factors.

Table 35: Toilet and Water facilitiesof Mawpat and Mawsynram block of East Khasi Hills District

Type of Toilet	**Mawpat**	**Mawsynram**	**East Khasi Hills (2 Blocks)**
Open field	0	6 (1.99%)	6 (1.99%)
Pit latrine without slab	31 (10.30%)	25 (8.31%)	56 (18.60%)
Pit latrine with slab	100 (33.22%)	114 (37.87%)	214 (71.10%)
Flush Toilet	15 (4.98%)	2 (0.66%)	17 (5.65%)
Western Toilet	4 (1.33%)	4 (1.33%)	8 (2.66%)
Total	150 (49.83%)	151 (50.17%)	301 (100%)
Source of Water in Toilet	**Mawpat**	**Mawsynram**	**East Khasi Hills (2 Blocks)**
No	90 (29.90%)	101 (33.55%)	191 (63.46%)
Yes	60 (19.93%)	50 (15.28%)	110 (36.54%)
Total	150 (49.83%)	151 (50.17%)	301 (100%)
Alternate Source of Water in Toilet	**Mawpat**	**Mawsynram**	**East Khasi Hills (2 Blocks)**
Pond/Stream/River/Well	78 (40%)	17 (8.72%)	95 (48.72%)
Piped water outside toilet	12 (6.15%)	84 (43.08%)	96 (49.23%)
Total	90 (46.15%)	101 (51.79%)	195 (100%)

The above table illustrates the types of toilet facilities available in the two studied blocks—Mawpat and Mawsynram—of East Khasi Hills district, Meghalaya. It also presents information on the availability of water sources in toilets and the alternative sources used when such facilities are lacking.

A majority of households (71.10%) were found to use pit latrines with slab, followed by pit latrines without slab (18.60%). The presence of flush toilets was relatively low (5.65%), and only 2.66% of households reported using western-style toilets. Notably, a very small proportion of households still practiced open defecation, and all such cases were reported exclusively from Mawsynram block. The distribution of pit latrines with slab was nearly equal in both blocks, with Mawpat reporting 100 and Mawsynram 114 households. However, in the case of pit latrines

without slab, Mawpat showed a slightly higher prevalence (10.30%) than Mawsynram (8.31%), possibly due to variation in the socio-economic or infrastructural development within the blocks.

Regarding the availability of water in toilets, the majority of households (63.46%) responded "No", while only 36.54% reported having a water source within the toilet. Interestingly, Mawsynram had a higher proportion of households (33.55%) lacking water in toilets compared to Mawpat (29.90%), which may reflect infrastructural disparities between the two regions. Overall, only 110 out of 301 households had a water source in the toilet, with Mawpat accounting for a slightly higher proportion (19.93%) than Mawsynram (15.28%).

Further analysis was conducted on the 195 households without a water source in the toilet to understand their alternative sources of water. Almost equal proportions of these households relied either on natural sources such as ponds, streams, rivers, or wells (48.72%) or on piped water located outside the toilet (49.23%). Surprisingly, a significant number of households in Mawpat (40%) reported bringing water from natural sources, despite Mawpat being more urbanized and closer to the district headquarters. On the other hand, a higher proportion of households in Mawsynram (43.08%) used piped water from outside the toilet, indicating some access to piped infrastructure even in relatively remote settings.

These findings highlight the uneven distribution of sanitation and water access across the two blocks and suggest the need for targeted infrastructural development, especially in improving in-toilet water availability and reducing reliance on external sources.

Table 36: Use of insect repellent and cleanliness practices for Household premisesof Mawpat and Mawsynram block of East Khasi Hills District

Preventive practices against mosquitoes	**Mawpat**	**Mawsynram**	**East Khasi Hills (2 Blocks)**
No	20 (6.64%)	12 (3.99%)	32 (10.63%)
Electric vaporizer machine	50 (16.61%)	33 (10.96%)	83 (27.57%)
Mosquito net	69 (22.92%)	104 (34.55%)	173 (57.48%)
Mosquito repellent	11 (3.65%)	2 (0.66%)	13 (4.32%)
Total	150 (49.83%)	151 (50.17%)	301 (100%)
Use of any material for keeping the flies and insects away	**Mawpat**	**Mawsynram**	**East Khasi Hills (2 Blocks)**
No	127 (42.19%)	140 (46.51%)	267 (88.70%)
Yes	23 (7.64%)	11 (3.65%)	34 (11.30%)
Total	150 (49.83%)	151 (50.17%)	301 (100%)
Keeping of any birds or goats/sheep/cattle/dogs within		**Mawsynram**	**East Khasi Hills (2**

the premises of the house			Blocks)
Yes	57 (18.94%)	52 (17.28%)	109 (36.21%)
No	93 (30.90%)	99 (32.89%)	192 (63.79%)
Total	150 (49.83%)	151 (50.17%)	301 (100%)
Ensuring cleanliness of the enclosures of birds/animals on a regular basis	**Mawpat**	**Mawsynram**	**East Khasi Hills (2 Blocks)**
No	32 (29.36%)	14 (12.84%)	46 (42.20%)
Yes	25 (22.94%)	38 (12.62%)	63 (57.80%)
Total	57 (52.29%)	52 (47.71%)	109 (100%)
Cleaning Procedure	**Mawpat**	**Mawsynram**	**East Khasi Hills (2 Blocks)**
With Water only	24 (38.10%)	32 (50.79%)	56 (88.89%)
With Disinfectant/ Surf	1 (1.59%)	6 (9.52%)	7 (11.11%)
Total	25 (39.68%)	38 (60.32%)	63 (100%)

The above table presents data on the use of insect repellents and cleanliness practices within household premises across Mawpat and Mawsynram blocks of East Khasi Hills district, Meghalaya. The primary variable considered in this analysis is preventive practices against mosquitoes. A significant proportion of households (57.48%) reported using *Mosquito Hit* spray, while 27.57% used electric vaporizer machines. Only 4.32% of households across both blocks used mosquito repellent creams. Notably, 32 out of 301 households (10.63%) reported not using any preventive measures against mosquitoes.

Regarding the use of materials to repel flies and other insects, a vast majority (88.70%) of households indicated that they did not use any such materials. Only 34 households (11.30%) reported using specific substances to keep insects away.

In terms of keeping animals within household premises, 109 out of 301 households (36.21%) reported rearing birds or domestic animals such as goats, sheep, cattle, or dogs. The remaining 63.79% did not keep any such animals. Among the households that kept animals, a majority (57.80%) reported maintaining regular cleanliness of the enclosures. Of these, 88.89% used only water for cleaning, while 11.11% used disinfectants or surf.

Block-wise analysis revealed that Mawpat (18.94%) had a slightly higher proportion of households keeping animals compared to Mawsynram (17.28%). However, in terms of cleanliness awareness, Mawpat (29.36%) showed lower compliance with regular cleaning practices than Mawsynram (12.84%). Furthermore, Mawsynram households (9.52%) demonstrated better hygiene practices by using disinfectant or surf, compared to Mawpat.

Table 37: Household Hygiene Index of Mawpat and Mawsynram block of East Khasi Hills

Categories	Mawpat	Mawsynram	East Khasi Hills (2 Blocks)
Poor (0-15)	0	0	0
Satisfactory (16-30)	0	2 (0.66%)	2 (0.66%)
Above Average (31-45)	46 (15.28%)	112 (37.21%)	158 (52.49%)
High (46 and above)	104 (34.55%)	37 (12.29%)	141 (46.84%)
Total	150 (49.83%)	151 (50.17%)	301 (100%)

The above table presents the Household Hygiene Index for Mawpat and Mawsynram blocks of the East Khasi Hills district in Meghalaya. Households were categorized into four groups based on their scores: *poor*, *satisfactory*, *above average*, and *high*. A majority of households (52.49%) fell under the above average category, comprising 37.21% from Mawsynram and 15.28% from Mawpat.

In total, 46.84% of households were categorized as having a high hygiene index, with Mawpat contributing a larger share (34.55%) compared to Mawsynram (12.29%). Only two households from Mawsynram (0.66%) were found to have a satisfactory hygiene index. Notably, no households from either block were classified under the poor hygiene category.

Part B: Assessment of personal hygienic practices of Mawpat and Mawsynram block

Table 38: Evaluation of Personal Hygiene of Mawpat and Mawsynram block of East Khasi Hills District, Meghalaya

Regular hand washing before taking meal	Mawpat	Mawsynram	East Khasi Hills (2 Blocks)
No	2 (0.66%)	0	2 (0.66%)
Yes	148 (49.17%)	151 (50.17%)	299 (99.34%)
Total	150 (49.83%)	151 (50.17%)	301 (100%)
Material Used for washing hands (before taking meal)	**Mawpat**	**Mawsynram**	**East Khasi Hills (2 Blocks)**
With Water Only	13 (4.35%)	6 (2.01%)	19 (6.35%)
With Water and Soap	135 (45.15%)	145 (48.49%)	280 (93.65%)
Total	148 (49.50%)	151 (50.50%)	299 (100%)
Frequency of brushing Teeth	**Mawpat**	**Mawsynram**	**East Khasi Hills (2 Blocks)**
Once in a day	122 (40.53%)	109 (36.21%)	231 (76.74%)
Twice in a day	28 (9.30%)	42 (13.95%)	70 (23.26%)
Total	150 (49.83%)	151 (50.17%)	301 (100%)

Material used for brushing	**Mawpat**	**Mawsynram**	**East Khasi Hills (2 Blocks)**
Toothpaste and brush	150 (49.83%)	151 (50.17%)	301 (100%)
Bathing practice (in winter)	**Mawpat**	**Mawsynram**	**East Khasi Hills (2 Blocks)**
Once in a week	2 (0.66%)	9 (2.99%)	11 (3.65%)
2-3 day in a week	140 (46.51%)	86 (28.57%)	226 (75.08%)
Everyday	8 (2.66%)	56 (18.60%)	64 (21.26%)
Total	150 (49.83%)	151 (50.17%)	301 (100%)
Bathing practice (in other season)	**Mawpat**	**Mawsynram**	**East Khasi Hills (2 Blocks)**
Once in a week	1 (0.33%)	0	1 (0.33%)
2-3 day in a week	80 (26.58%)	31 (10.30%)	111 (36.88%)
Everyday	69 (22.92%)	120 (39.87%)	189 (62.79%)
Total	150 (49.83%)	151 (50.17%)	301 (100%)
Place of Bathing	**Mawpat**	**Mawsynram**	**East Khasi Hills (2 Blocks)**
Stream	13 (4.32%)	22 (7.31%)	35 (11.63%)
Temporary settlements	3 (0.99%)	21 (6.98%)	24 (7.97%)
Bathroom	134 (44.52%)	108 (35.88%)	242 (80.40%)
Total	150 (49.83%)	151 (50.17%)	301 (100%)
Frequency of soap use during bath	**Mawpat**	**Mawsynram**	**East Khasi Hills (2 Blocks)**
2-3 day in a week	4 (1.33%)	9 (2.99%)	13 (4.32%)
Every time	146 (48.50%)	142 (47.18%)	288 (95.68%)
Total	150 (49.83%)	151 (50.17%)	301 (100%)
Frequency of hair combing	**Mawpat**	**Mawsynram**	**East Khasi Hills (2 Blocks)**
2-3 days in a week	1 (0.33%)	9 (2.99%)	10 (3.32%)
Everyday	149 (49.50%)	142 (47.18%)	291 (96.68%)
Total	150 (49.83%)	151 (50.17%)	301 (100%)
Frequency of nail trimming	**Mawpat**	**Mawsynram**	**East Khasi Hills (2 Blocks)**
Weekly	93 (30.90%)	98 (32.56%)	191 (63.46%)
When it grows	26 (8.64%)	26 (8.64%)	52 (17.28%)
Fortnightly	24 (7.97%)	19 (6.31%)	43 (14.29%)
Monthly	7 (2.33%)	4 (1.33%)	11 (3.65%)
Rarely	0	4 (1.33%)	4 (1.33%)
Total	150 (49.83%)	151 (50.17%)	301 (100%)

Habitual use of footwear	Mawpat	Mawsynram	East Khasi Hills (2 Blocks)
No	2 (0.66%)	1 (0.33%)	3 (0.99%)
Yes	148 (49.17%)	150 (49.83%)	298 (99.01%)
Total	150 (49.83%)	151 (50.17%)	301 (100%)
Place of defecation	**Mawpat**	**Mawsynram**	**East Khasi Hills (2 Blocks)**
Open field	0	6 (1.99%)	6 (1.99%)
Common/ Community Latrine	11 (3.65%)	7 (2.33%)	18 (5.98%)
Private Latrine	139 (46.18%)	138 (45.85%)	277 (92.03%)
Total	150 (49.83%)	151 (50.17%)	301 (100%)
Habit of washing hand after defecation	**Mawpat**	**Mawsynram**	**East Khasi Hills (2 Blocks)**
No	7 (2.33%)	1 (0.33%)	8 (2.66%)
Yes	143 (47.51%)	150 (49.83%)	293 (97.34%)
Total	150 (49.83%)	151 (50.17%)	301 (100%)
Material Used for washing hands (after defecation)	**Mawpat**	**Mawsynram**	**East Khasi Hills (2 Blocks)**
Water Only	18 (6.14%)	18(6.14%)	36 (12.29%)
Water and Soap	125 (42.66%)	131(44.71%)	256 (87.37%)
Toilet paper	0	1 (0.34%)	1 (0.34%)
Total	143 (48.81%)	150 (51.19%)	293 (100%)

The above table presents an evaluation of personal hygiene practices in Mawpat and Mawsynram blocks of the East Khasi Hills district, Meghalaya. A total of 14 variables were considered to assess personal hygiene, including practices such as hand washing, bathing, nail trimming, use of footwear, place of defecation, and hand washing after defecation.

Almost all participants (99.34%) reported washing their hands before meals, with the exception of two individuals from Mawpat. Of the 299 participants who followed this practice, 93.65% (n=280) used soap, while 6.35% (n=19) used only water. Given the region's high altitude and relatively low winter temperatures, bathing practices were categorized by season—winter and other seasons—for contextual relevance.

In terms of hair combing, the majority of participants (96.68%) combed their hair daily, while 3.32% reported doing so 2–3 times per week. For nail trimming, 63.46% trimmed their nails weekly, followed by 17.28% who did so when they noticed nail growth, and 14.29% who followed a fortnightly routine. A small fraction (3.65%) trimmed their nails only monthly. In all aspects, Mawpat and Mawsynram blocks showed comparable patterns.

Regarding footwear usage, 99.01% of female participants habitually used footwear, while only 0.99% (three individuals—two from Mawpat and one from Mawsynram) did not use footwear regularly.

Further analysis was conducted on defecation-related hygiene practices. A vast majority (92.03%) used private latrines, followed by 5.98% who used common or community latrines. Only six participants (1.99%) practiced open defecation, all of whom were from Mawsynram. Hand washing after defecation was practiced by 97.34% of participants (n=293), with both blocks displaying nearly equal frequencies. Notably, seven of the eight participants who did not wash hands after defecation were from Mawpat—despite it being closer to the district headquarters.

Finally, regarding the materials used for hand washing after defecation, 87.71% (n=257) used soap, while 12.29% used only water.

Table 39: Personal Hygiene Index of Mawpat and Mawsynram block of East Khasi Hills

Categories	Mawpat	Mawsynram	East Khasi Hills (2 Blocks)
Poor (0-7)	0	0	0
Satisfactory (8-14)	0	0	0
Above Average (15-21)	10 (3.32%)	5 (1.66%)	15 (4.98%)
High (22 and above)	140 (46.51%)	146 (48.50%)	286 (95.02%)
Total	150 (49.83%)	151 (50.17%)	301 (100)

The Personal Hygiene Index, as presented in the table above, was categorized into four levels: poor (0–7), satisfactory (8–14), above average (15–21), and high (22 and above). Notably, none of the participants from either block fell under the poor or satisfactory categories. The majority of participants (95.02%) were classified under the high index category, followed by above average (4.98%). Within the above average category, Mawpat block showed a higher prevalence (3.32%) compared to Mawsynram (1.66%). Conversely, for the high index category, Mawsynram block reported a slightly higher prevalence (48.50%) than Mawpat (46.51%).

Table 40: Menstrual Hygiene Practices of Studied Womenof Mawpat and Mawsynram Block of East Khasi Hills

Material Used During Menstruation	Mawpat	Mawsynram	East Khasi Hills (2 Blocks)
Cloth	55 (18.27%)	83 (27.57%)	138 (45.85%)
Cloth and Sanitary Napkin	9 (2.99%)	10 (3.32%)	19 (6.31%)
Sanitary Napkin	86 (28.57%)	58 (19.27%)	144 (47.84%)
Total	150 (49.83%)	151 (50.17%)	301 (100%)
Frequency of Changing of	**Mawpat**	**Mawsynram**	**East Khasi Hills**

Material Used During Menstruation			**(2 Blocks)**
Once	3 (0.99%)	0	3 (0.99%)
Twice	48 (15.95%)	50 (16.61%)	98 (32.56%)
Thrice	77 (25.58%)	80 (26.58%)	157 (52.16%)
More Than Thrice	21 (6.98%)	21 (6.98%)	42 (13.95%)
Total	150 (49.83%)	151 (50.17%)	301 (100%)
If, you use cloth, what is the general practice you follow	**Mawpat**	**Mawsynram**	**East Khasi Hills (2 Blocks)**
Wash and reuse	64 (40.76%)	93 (59.24%)	157 (100%)
Total	64 (40.76%)	93 (59.24%)	157 (100%)
Disposing of Used Material During Menstruation	**Mawpat**	**Mawsynram**	**East Khasi Hills (2 Blocks)**
Burn	21 (6.98%)	46(15.28%)	67 (22.26%)
Burry	6 (1.99%)	1 (0.33%)	7 (2.33%)
Dispose into Garbage	123 (40.86%)	104 (34.55%)	227 (75.42%)
Total	150 (49.83%)	151 (50.17%)	301 (100%)

The table demonstrates the practices related to menstrual hygiene followed by the studied women of Mawpat and Mawsynram block. In Mawpat block, sanitary napkins (28.57%) are the most preferred choice of the mothers followed by cloth (18.27%). Also, 9 (2.99%) women from Mawpat block were found using both cloth and sanitary napkins during their menstruation. On the other hand, 27.57% of the women of Mawsynram block preferred cloths over sanitary napkins as a menstrual absorbent, possibly due to their low socio-economic condition. 3.23% of mothers use both cloth and sanitary napkins and about 19.27% use only sanitary napkins.

During menstruation, the highest frequency of changing of materials of menstruation from both the blocks was three times in a day, 25.58% from Mawpat block and 26.58% from Mawsynram block, followed by 15.95% women from Mawpat block and 16.61% women from Mawsynram block changed their material two times in a day. However, equal percentages of women from both the blocks i.e., 6.98% changed their materials more than thrice. But in Mawpat block, 3 (0.99%) women changed their materials only once in a day which was not found from Mawsynram block. The table also reveals that the women used cloth as a menstrual absorbent and washing and reusing the cloth again and again for a prolonged period to manage their menstruation makesthem more vulnerable to reproductive and urinary infections.

Additionally, the table also reveals the methods used by the women in disposing the materials used during menstruation. Majority of women from both Mawpat (40.86%) and Mawsynram (34.55%) block disposed the used materials into the garbage, followed by 6.98% women from

Mawpat block and 15.28% women from Mawsynram block burned the materials after using it. While only 1.99% women from Mawpat block and 0.33% women from Mawsynram block burry the used materials.

Table 41: Illness Related to Menstruation Experienced by the Studied Women of Mawpat and Mawsynram Block of East Khasi Hills

Illness related to menstruation	**Mawpat**	**Mawsynram**	**East Khasi Hills (2 Blocks)**
Yes	72 (23.92%)	45 (14.95%)	117 (38.87%)
No	78 (25.91%)	106 (35.22%)	184 (61.13%)
Total	150 (49.83%)	151 (50.17%)	301 (100%)
Types of illness during menstruation (if, yes)	**Mawpat**	**Mawsynram**	**East Khasi Hills (2 Blocks)**
Dysmenorrhea	4 (3.42%)	2 (1.71%)	6 (5.13%)
Pelvic or Abdominal or Back pain	30 (25.64%)	27 (23.08%)	57 (48.72%)
Menorrhagia	5 (4.27%)	1 (0.85%)	6 (5.13%)
Irregular or Infrequent periods	1 (0.85%)	3 (2.56%)	4 (3.42%)
Dysmenorrhea /Pelvic or Abdominal or Back pain	27 (23.08%)	9 (7.69%)	36 (30.77%)
Pelvic or Abdominal or Back pain/ Irregular or Infrequent periods	0	1 (0.85%)	1 (0.85%)
Pelvic or Abdominal or Back pain/ Menorrhagia	5 (4.27%)	1 (0.85%)	6
Menorrhagia/ Irregular or infrequent periods	0	1 (0.85%)	1 (0.85%)
Total	72 (23.92%)	45 (38.46%)	117 (100%)

The table illustrates about the illnesses experienced by the women of both Mawpat and Mawsynram block. It was found that 117 (38.87%) women suffer from illness of one kind or other during menstruation. While, 184 (61.13%) women does not suffer from any illness. Pelvic or abdominal or back pain was the most suffered illness experienced by the women of Mawpat (25.64%) and Mawsynram (23.08%) block. Women from both Mawpat and Mawsynram block also suffered from Dysmenorrhea (5.13%), Menorrhagia (5.13%) and Irregular or infrequent periods (3.42%) respectively. Moreover, there were also women from both the block who suffered from more than one or two menstrual illnesses the highest frequency of it was noted from Mawpat block. 23.08% women from Mawpat block suffered from both dysmenorrheal and pelvic or abdominal or back pain while only 7.69% women from Mawsynram block suffered from it. Whereas, equal percentages of mothers from Mawsynram block i.e., 0.85% suffered

either from pelvic or abdominal or back pain/ irregular or infrequent periods or from pelvic or abdominal or back pain/ menorrhagia or from menorrhagia/ irregular or infrequent periods. But among 4.27% women of Mawpat block pelvic or abdominal or back pain/ menorrhagia was the suffered illness.

Table 42: Opinions about Menstruation among the Studied Women of Mawpat and Mawsynram Block of East Khasi Hills

Following of any taboo during menstruation	**Mawpat**	**Mawsynram**	**East Khasi Hills (2 Blocks)**
Yes	3 (0.99%)	0	3 (0.99%)
No	147 (48.84%)	151 (50.17%)	298 (99.01%)
Total	150 (49.83%)	151 (50.17%)	301 (100%)
Opinions about Menstruation	**Mawpat**	**Mawsynram**	**East Khasi Hills (2 Blocks)**
It is painful	16 (5.32%)	1 (0.33%)	17 (5.65%)
It is god's blessing	36 (11.96%)	12 (3.99%)	48 (15.95%)
Menstruation gives meaning to womanhood	69 (22.92%)	102 (33.89%)	171 (56.81%)
God's blessing/ Gives meaning to womanhood	8 (2.66%)	36 (11.96%)	44 (14.62%)
It is normal	2 (0.66%)	0	2 (0.66%)
No response	19 (6.31%)	0	19 (6.31%)
Total	150 (49.83%)	151 (50.17%)	301 (100%)

The table reveals the opinions or taboo followed by the women of Mawpat and Mawsynram block. From the table it is clear that 99.01% women do not follow any taboos during menstruation while only 0.99% women follow taboos. The table also depicts different kinds of opinions possessed by the women of both blocks. Maximum of the women 22.92% from Mawpat block and 33.89% from Mawsynram block felt that menstruation gave meaning to their womanhood. Whereas, 11.96% women from both Mawpat and Mawsynram block felt that menstruation is either god's blessing or it is both god's blessing or it gives meaning to womanhood. 5.32% women from Mawpat block and 0.33% women from Mawsynram block felt that menstruation is painful. Meanwhile, 3.99% women from Mawsynram block and 2.66% women from Mawpat block felt that menstruation is either god's blessing or it is both god's blessing or it gives meaning to womanhood respectively. Moreover, 0.66% women from Mawpat block said that menstruation is normal and 6.31% women from Mawpat block had no opinion regarding menstruation.

Part C: Addiction behaviourand practices found in Mawpat and Mawsynram Block

During the survey among the Khasi community, it was observed that chewing of betel nuts (Areca *catechu)* were common practice among them. An estimated 600 million people, particularly in south-east asian countries, have the habit of chewing betel nuts in any form. Epidemiological studied suggest that 20% - 40% of the population over the age of 15 years in countries like India, Nepal and Pakistan are addicted with chewing of betel nut (Kumar *et al*., 2021).

In north – east India, people consume betel nut in various forms. In Meghalaya, betel nut is commonly called "*Kwai"* (Mahanta *et al,* 2015).

Table 43: Addiction practices among the women of Mawpat and Mawsynram Blocks of East Khasi Hills District.

Addiction Practice	Mawpat	Mawsynram	East Khasi Hills District (2 Blocks)
Only Chewing	115 (38.21%)	116 (38.54%)	231 (76.74%)
Chewing and Drinking	2 (0.66%)	0	2 (0.66%)
No Addiction	35 (11.63%)	35 (11.63%)	70 (23.26%)
Total	150 (49.83%)	151 (50.17%)	301 (100%)

The above table demonstrated the addiction practices and behavior of women of East Khasi Hills District of Meghalaya. From the table it is evident that chewing and drinking are the most prevalent practices among the studied women of East Khasi Hills. The most prevalent addiction practice was chewing only 76.74%. The other practices like chewing and drinking showed very nominal presence that is 0.66%. Only 22.59% of studied women are devoid of any addiction.

Table 44: Use of substances among the women of Mawpat and Mawsynram Blocks of East Khasi Hills District

Use of substances	Mawpat	Mawsynram	East Khasi Hills District (2 Blocks)
Betel nut	114 (49.35%)	105 (45.45%)	219 (94.81%)
Betel nut with Tobacco	1 (0.43%)	11 (4.76%)	12 (5.19%)
Total	115 (49.78%)	116 (50.22%)	231 (100%)

The above table depicts the usage of substances among the studied mothers of Mawpat and Mawsynram block. Here, out of 301 mothers only 231 mothers were taken into consideration, excluding the mothers without any addiction (70). From the table it can be understood that

majority of studied women that is 94.81% from both the blocks use only betel nut as a source of addiction. While 5.19% of studied women from both the blocks uses betel nut along with tobacco as a source of addiction.

Table 45: Frequency of consumption of betel nut and betel leaf (per day) among the mothers of Mawpat and Mawsynram Blocks of East Khasi Hills District

Frequency of Consumption per day (betel nut and betel leaf)	Mawpat	Mawsynram	East Khasi Hills District (2 Blocks)
1-3	49 (21.21%)	61 (26.41%)	110 (47.62%)
4-6	45 (19.48%)	31 (13.42%)	76 (32.90%)
7-9	2 (0.87%)	4 (1.73%)	6 (2.60%)
10-15	19 (8.23%)	21 (9.09%)	40 (17.32%)
Total	115 (49.78%)	116 (50.22%)	231 (100%)

The above table shows the frequency of consumption of betel nut and leaf (per day) among the studied mothers of Mawpat and Mawsynram block. Here out of 301 mothers only those mothers (231) were taken into consideration who consumes betel nut and betel leaf, excluding the mothers without any addiction (70). Here, maximum of the studied women that is 47.62% from both the block consume betel nut and betel leaf 1 – 3 times in a day followed by 32.90% of women consume betel nut and betel leaf 4 – 6 times in a day. Moreover, 17.32% of studied women from both the blocks consume betel nut and leaf 10 – 15 times in a day, while 2.60% of women consume betel nut and betel leaf 7 – 9 times in a day.

Chapter 3
Reproductive Status of Women and Maternal Care

Table 46: Age at Menarche of the Studied Mothers of Mawpat and Mawsynram Blocks of East Khasi Hills

Age (in years)	Mawpat	Mawsynram	Total
10 – 12	25 (8.28%)	22 (7.28%)	47 (15.56%)
13 – 15	106 (35.10%)	117 (38.74%)	223 (73.84%)
16 and above	19 (6.29%)	13 (4.30%)	32 (10.60%)
Total	150 (49.67%)	152 (50.33%)	302 (100%)

The table represents age at menarche of the studied mothers of Mawpat and Mawsynram of East Khasi Hills District of Meghalaya. The studied mothers were categorized into different age groups such as 10 – 12 years, 13 – 15 years and 16 years and above on the basis of the age at which they attained menarche. A total of 302 mothers were studied based on this criterion. The table depicts that majority of mother attained menarche at the age of 13 – 15 years with 35.10% mothers from Mawpat block and 38.74% mothers from Mawsynram block followed by 8.28% mothers from Mawpat block and 7.28% mothers from Mawsynram block attained menarche at the age of 10 – 12 years. Also, 10.60% of the total studied mothers from both the blocks attained menarche at the age of 16 years and above.

Table 47: Current physiological Stage of the Studied Mothers of Mawpat and Mawsynram Blocks of East Khasi Hills

Current Physiological Stage	Mawpat	Mawsynram	Total
Pregnant	15 (4.97%)	7 (2.32%)	22 (7.28%)
Lactating	34 (11.26%)	38 (12.58%)	72 (23.84%)
Pregnant+Mother having child below 59 months	8 (2.65%)	15 (4.97%)	23 (7.62%)
Lactating + Mother having child below 59 months	29 (9.60%)	21 (6.95%)	50 (16.56%)
Mother having child below 59 months	30 (9.93%)	39 (12.91%)	69 (22.85%)
Mother having child above 59 months	34 (11.26%)	32 (10.60%)	66 (21.85%)
Total	150 (49.67%)	152 (50.33%)	302 (100%)

The table reveals the current physiological stage of mothers of Mawpat and Mawsynram during the study. A total of 302 mothers were studied with 150 mothers from Mawpat block and 152 mothers from Mawsynram block. From the table, it can be well understood that equal percentagesof mothers from Mawpat block were lactating and have children above 59 months (11.26%). Whereas in Mawsynram block, majority of mothers have children below 59 months (12.91%). In case of pregnancy, higher percentages of mothers were reported from Mawpat block (4.97%) than Mawsynram block (2.32%). Moreover, in Mawsyram block, 12.58% mothers were lactating followed by 4.97% mothers were pregnant and also have children below 59 months and 6.95% mothers were lactating and have children below 59 months. Also, 10.60% mothers in Mawsynram have children above 59 months. Meanwhile, in Mawpat block, 9.60% mothers were lactating and also have children below 59 months and 9.93% mothers have children below 59 months.

Table 48: Birth records (Live Births and Surviving Children) of Children from Mawpat and Mawsynram Block of East Khasi Hills District

Category	Mawpat		Mawsynram		Total
	Male	Female	Male	Female	
Number of Live Births	221 (26.40%)	174 (20.79%)	242 (28.91%)	200 (23.89%)	837 (100%)
Number of Surviving Children	211 (25.21%)	171 (20.43%)	234 (27.96%)	192 (22.94%)	808 (96.54%)

The table demonstrates the birth records including the number of live births and number of surviving children compared to the live births of children from Mawpat and Mawsynram block collected during the study. Both the number of live births and surviving children are more in Mawsynram block than in Mawpat block. A total of 221 male births from Mawpat block and 242 male births from Mawsynram block were recorded, similarly a total of 174 female births from Mawpat block and 200 female births from Mawsynram block were recorded. In comparison to this live births, 211 males and 171 females from Mawpat block and 234 males and 192 females from Mawsynram block survived.

Table 49: Reproductive Losses Experienced by the Studied Mothers of Mawpat and Mawsynram Blocks of East Khasi Hills District

Reproductive Losses	Mawpat	Mawsynram	East Khasi Hills (2 Blocks)
1 Time	27 (36.49%)	31 (41.89%)	58 (78.38%)

2 Times	3 (4.05%)	3 (4.05%)	6 (8.11%)
3 Times	4 (5.41%)	2 (2.70%)	6 (8.11%)
4 Times	2 (2.70%)	1 (1.35%)	3 (4.05%)
5 Times	1 (1.35%)	0	1 (1.35%)
Total	37 (50%)	37 (50%)	74 (100%)

The table depicts the number of reproductive losses experienced by the mothers of Mawpat and Mawsynram block of East Khasi Hills District. A total of 74 reproductive losses were experienced with equal percentages of mothers experiencing reproductive losses from both the blocks. Higher percentages of mothers that is 36.49% mothers from Mawpat block and 41.89% mothers from Mawsynram block experienced reproductive loss only one time. While uniformly, 4.05% of mothers from both Mawpat and Mawsynram block experienced reproductive losses two times. Whereas 8.11% mothers combining both the blocks experienced reproductive losses 3 times followed by 4.05% mothers experiencing reproductive losses 5 times and 1.35% mothers experiencing reproductive losses 5 times.

Section A
Pregnant Mothers of Khasi Community of East Khasi Hills

Table 50: Self Reported Complications faced during Pregnancy by the Pregnant Mothers of Mawpat and Mawsynram block of East Khasi Hills

Complications	Mawpat		Mawsynram		Total		
	Yes	No	Yes	No	Yes	No	Total
Weight Loss	0	23 (51.11%)	0	22 (48.89%)	0	45 (100%)	45 (100%)
Nausea and Vomiting	0	23 (51.11%)	0	22 (48.89%)	0	45 (100%)	45 (100%)
High Blood Pressure	0	23 (51.11%)	1 (2.22%)	21 (46.67%)	1 (2.22%)	44 (97.78%)	45 (100%)
Severe Headache	0	23 (51.11%)	0	22 (48.89%)	0	45 (100%)	45 (100%)
Lower Back Pain	3 (6.67%)	20 (44.44%)	1 (2.22%)	21 (46.67%)	4 (8.89%)	41 (91.11%)	45 (100%)
Weight Gain	2 (4.44%)	21 (46.67%)	0	22 (48.89%)	2 (4.44%)	43 (95.56%)	45 (100%)
Gestational Diabetes	0	23 (51.11%)	0	22 (48.89%)	0	45 (100%)	45 (100%)
Low Blood Pressure	0	23 (51.11%)	0	22 (48.89%)	0	45 (100%)	45 (100%)

Anaemia	1 (2.22%)	22 (48.89%)	0	22 (48.89%)	1 (2.22%)	44 (97.78%)	45 (100%)
Multiple Complications (3 or more)	9 (20%)	14 (31.11%)	11 (24.44%)	11 (24.44%)	20 (44.44%)	25 (55.56%)	45 (100%)
No Complications	8 (17.78%)	15 (33.33%)	9 (20%)	13 (28.89%)	17 (37.78%)	28 (62.22%)	45 (100%)

The table depicts the complications faced by the mothers during pregnancy. Total 45 pregnant mothers from both the blocks were considered and it was found that 28 mothers did not faced any complications during their pregnancy period while 17 mothers faced some complications during their pregnancy. Higher percentages of mothers from both the blocks were reported to have been suffering from multiple complications with 20% mothers from Mawpat block and 24.44% mothers from Mawsynram block. While only one (2.22%) mother from Mawsynram block was reported to suffer from high blood pressure and lower back pain. Whereas, 3 (6.67%) mothers, 2 (4.44%) mothers and 1 (2.22%) from Mawpat block were reported to have been suffering from lower back pain, weight gain and anaemia.

Table 51: Current trimester of Pregnant Mothers of Mawpat and Mawsynram block of East Khasi Hills

Exact Trimester of Pregnancy	Mawpat	Mawsynram	Total
1st Trimester (1-3 months)	3 (42.86%)	4 (57.14%)	7 (15.56%)
2nd Trimester (4-6 months)	11 (44%)	14 (56%)	25 (55.55%)
3rd Trimester (7-9 months)	9 (69.23%)	4 (30.77%)	13 (28.89%)
Total	23 (51.11%)	22 (48.89%)	45 (100%)

The table shows the current trimester of the pregnant women of Mawpat and Mawsynram block when they were studied. In the present study, it is found that among 45studied pregnant women the highest number of women were found to be in their 2nd trimester of pregnancy (55.55%), followed by 3rd trimester (28.89%), and lowest is found to be in their 1st trimester (15.56%) of pregnancy. In the 1st trimester out of total 7 pregnant women maximum number that is 4 mothers were found from Mawsynram block followed by Mawpat block which is 3 women. In the2nd trimester out of 25 pregnant women the maximum number i.e., 14 were found from Mawsynram block followed by Mawpat block which is 11 in total. In the 3nd trimester out of 13 pregnant

women the maximum number i.e., 9 were found from Mawpat block followed by Mawsynram block which is 4.

Table 52: Initial month of visit to the health care provider by the Pregnant Mothers of Mawpat and Mawsynram block of East Khasi Hills

Initial Month of Visit	Mawpat	Mawsynram	Total
1-2 months	12 (54.55%)	10 (45.45%)	22 (48.89%)
3-4 months	6 (40%)	9 (60%)	15 (33.33%)
5-6 months	3 (75%)	1 (25%)	4 (8.89%)
7 – 8 months	1 (100%)	0	1 (2.22%)
No medical Consultation	1 (33.33%)	2 (66.67%)	3 (6.67%)
Total	23 (51.11%)	22 (48.89%)	45 (100%)

The table illustrates the month of the initial visit by pregnant women to a health care provider in Mawpat and Mawsynram block of East Khasi Hills. Out of 45 pregnant women, the highest number (48.89%) reported visiting their nearby health care provider during the 1^{st} – 2^{nd} month of pregnancy. Additionally, 33.33% of the women made their first visit to a health center within the 3^{rd} – 4^{th} month of pregnancy.4 out of 45 pregnant women (8.89%) visited a health center for the first time during the 5^{th} - 6^{th} month of pregnancy and 1 (2.22%) pregnant mother from Mawpat block made its first initial visit to the health care provider during 7^{th} – 8^{th} months of pregnancy. Notably, three (6.67%) pregnant woman from both the blocks did not visit any health center, indicating no medical consultation during her pregnancy.

Table 53: Initial person for consultation by the Pregnant Mothers of Mawpat and Mawsynram block of East Khasi Hills

Consulting Person	Mawpat	Mawsynram	Total
Govt. Staff*	18 (42.86%)	20 (47.62%)	38 (90.48%)
Private Staff**	4 (9.52%)	0	4 (9.52%)
Total	22(52.38%)	20 (47.62%)	42(100%)

Note: *In the present study it is found that out of 45 pregnant women one mother from Mawpat block and 2 mothers from Mawsynram block was not consulting any person (Govt. staff or private staff) during her pregnancy.
Govt. Staff* ASHA, UPHC, Sub-Center, VHC, PHC, CHC, and Govt. Hospital
Private Staff**Private Clinic, and Private Hospital

The table explains the persons initially consulted by the pregnant women in Mawpat and Mawsynram block of East Khasi Hills District. It was found that the highest number of women

(90.48%) was found to be consulting the Government staff which are ASHA (Accredited Social Health Activist) , Sub-Center, PHC (Primary Health Centre), CHC (Community Health Centre), and Govt. Hospital and notably four (9.52%) pregnant women from Mawpat block were found to be consulting the private staff (9.52%) which are Private Clinic, and Private Hospital while no pregnant women were found to be consulting the private staff from Mawsynram block. Moreover, it wasalso found that one mother from Mawpat block and two mothers from Mawsynram block were not consulting any person either Govt. staff or private staff during their pregnancy.

Table 54: Frequency of consulting with the health care provider by the Pregnant Mothers of Mawpat and Mawsynram block of East Khasi Hills

Frequency of Consulting	Mawpat	Mawsynram	Total
As per advised schedule	22 (52.38%)	17 (40.48%)	39 (92.56%)
When it is required/complication	0	3 (7.14%)	3 (7.14%)
Total	22(52.38%)	20 (47.62%)	42 (100%)

Note: *In the present study it is found that out of 45 pregnant women one mother from Mawpat block and two mothers from Mawsynram block was not consulting any person (Govt. staff or private staff) during her pregnancy.

The table demonstrates the frequency of consulting the health care provider by the pregnant mothers during their pregnancy in Mawpat and Mawsynram block. It was found that 92.56% mothers with 52.38% mothers from Mawpat block and 40.48% mothers from Mawsynram block consulted their health care provider as per advised schedule. While, only 7.14% mothers that too from Mawsynram block consulted any health care provider whenever there is some complications.

Table 55: Receiving of health card by the Pregnant Mothers of Mawpat and Mawsynram block of East Khasi Hills

Health Card	Mawpat	Mawsynram	Total
Govt. Health Card	17 (40.48%)	17 (40.48%)	34 (80.95%)
No Health Card	5 (11.90%)	3 (7.14%)	8 (19.05%)
Total	22 (52.38%)	20 (47.62%)	42 (100%)

Note: *In the present study it is found that out of 45 pregnant women one mother from Mawpat block and two mothers from Mawsynram block was not consulting any person (Govt. staff or private staff) during her pregnancy.

The table illustrates information related to the receiving of any health card by the pregnant mothers from any health institutions. In the present study, it was found that 34 pregnant women (80.95%) received the health card from the government health centre. It was also found that out of 42 pregnant women 5 (11.90%) from Mawpat block and 3 (7.14%) from Mawsynram block did not receive any health card during their pregnancy.

Table 56: Planned place of delivery of the Pregnant Mothers of Mawpat and Mawsynram block of East Khasi Hills

Planned Place of Delivery	Mawpat	Mawsynram	Total
Govt. Hospital	14 (31.11%)	19 (42.22%)	33 (73.33%)
Private Hospital	5 (11.11%)	0	5 (11.11%)
Residence	3 (6.67%)	2 (4.44%)	5 (11.11%)
Primary Health Centre	0	1 (2.22%)	1 (2.22%)
Undecided	1 (2.22%)	0	1 (2.22%)
Total	23 (51.11%)	22 (48.89%)	45 (100%)

The table depicts the place of delivery of the baby decided by the pregnant mothers and their family members in Mawpat and Mawsynram block. The findings indicated that majority of pregnant mothers (73.33%) decided to have delivery in government hospitals with highest number of mothers (19, 42.22%) from Mawsynram block. However, only 5 (11.11%) from Mawpat block chose private hospital for delivery while no such preference was found from Mawsynram block.Moreover 5 (11.11%) from both blocks expressed a preference for delivering at their residence with a higher frequency observed in the Mawpat block, and the delivery will be facilitated either by the traditional birth attendant or the elderly female member of the family in a hope of gettingcomfort and emotional support from their family especially mother and husband. Additionally, 1 (2.22%) mother from Mawsynram block preferred to give birth in Primary Health Centre and 1 (2.22%) mother from Mawpat block is yet to decide the place of delivery.

Table 57: Expected birth attendant of the Pregnant Mothers of Mawpat and Mawsynram block East Khasi Hills

Who will facilitate the delivery?	Mawpat	Mawsynram	Total
Doctor	19 (42.22%)	19 (42.22%)	38 (84.44%)
Family members	1 (2.22%)	1 (2.22%)	2 (4.44%)
Traditional Dai (Traditional Birth Attendant)	2 (4.44%)	1 (2.22%)	3 (6.67%)
Undecided	1 (2.22%)	1 (2.22%)	2 (4.44%)
Total	23 (51.11%)	22 (48.89%)	45 (100%)

The table here gives a detailed idea of the expected birth attendant who will facilitate the delivery of the pregnant mothers of Mawpat and Mawsynram block of East Khasi Hills District of Meghalaya. It was found that 84.44% of the pregnant mothers will be facilitated by the doctor during their delivery showing equal percentages (42.22%) of mothers from both Mawpat and Mawsynram block. It was also found that 2.22% mothers from both Mawpat and Mawsynram block will be facilitated by family members during their delivery. 6.67% of women from the studied pregnant mothers responded that they have decided to be facilitated by traditional dai or traditional birth attendant during their delivery with Mawpat block showing higher frequency (4.44%) than Mawsynram block. Additionally, equal percentages (2.22%) of pregnant mothers from Mawpat and Mawsynram block have not yet planned for who will be her birth attendant. delivery.

Table 58: Vaccination of Pregnant Mothers in Mawpat and Mawsynram block of East Khasi Hills

Vaccination	Available Mother		1st Dose		2st Dose		3st Dose		Total
	Mawpat	Mawsynram	Mawpat	Mawsynram	Mawpat	Mawsynram	Mawpat	Mawsynram	
1st Trimester	3 (7.14%)	4 (9.52%)	2 (40%)	3 (60%)	-	-	-	-	5 (13.89%)
2st Trimester	10 (23.81%)	12 (28.57%)	-	-	8 (44.44%)	10 (55.56%)	-	-	18 (50%)
3st Trimester	9 (21.43%)	4 (9.52%)	-	-	-	-	9 (69.23%)	4 (30.77%)	13 (36.11%)
Total	42(100%)		5 (100%)		18 (100%)		13 (100%)		36 (100%)

Note: *In the present study it is found that out of 45 pregnant women one mother from Mawpat block and two mothers from Mawsynram block was not consulting any person (Govt. staff or private staff) during her pregnancy. Also four mothers from Mawpat block and 3 mothers from Mawsynram block have not received vaccinations in any of the trimester.

The table reveals about the vaccination taken by the pregnant mothers of Mawpat and Mawsynram block during their pregnancy. It was found that out of 42 pregnant mothers who were consulting health care provider, 36 mothers received vaccination while 6 mothers were not vaccinated during their pregnancy.The data reveals that 13.89% mothers have received 1st dose of vaccination during 1st trimester, 50% have received 2nd dose of vaccination, and 36.11% of pregnant mothers have received 3rd dose of vaccine in their 3rd trimester. During the 1st trimester, out of 7 available mothers from both Mawpat and Mawsynram block, 5 mothers have been received first dose of vaccination with Mawsynram showing the highest frequency (60%). In the 2nd trimester, 18 mothers out of 22 available mothers have received vaccination again with Mawsynram showing the highest frequency (55.56%). Interestingly, in the 3rd trimester all the

available pregnant mothers have received their dose of vaccination with Mawpat showing the highest frequency (69.23%)

Table 59: Pre-natal Food Practices among the Pregnant Mothers of Mawpat and Mawsynram block of East Khasi Hills

Received advice on Prenatal food practices	**Mawpat**	**Mawsynram**	**Total**
Yes	14 (31.11%)	17 (37.78%)	31 (70.45%)
No	9 (20%)	5 (11.11%)	14 (29.55%)
Total	23 (51.11%)	22 (48.89%)	45 (100%)
Who advices you on food and diet	**Mawpat**	**Mawsynram**	**Total**
ASHA/Doctor	10 (32.26%)	14 (45.16%)	24 (77.42%)
Elderly family member/ASHA	4 (12.90%)	3 (9.68%)	7 (22.58%)
Total	14 (45.16%)	17 (54.84%)	31 (100%)
Restricted food during pregnancy	**Mawpat**	**Mawsynram**	**Total**
Spicy food	0	2 (6.45%)	2 (6.45%)
Bitter gourd	1 (3.23%)	0	1 (3.23%)
Papaya/ Pineapple	1 (3.23%)	1 (3.23%)	2 (6.45%)
No restrictions	12 (38.71%)	14 (45.16%)	26 (83.87%)
Total	14 (45.16%)	17 (54.84%)	31 (100%)
Food prescribed during pregnancy period	**Mawpat**	**Mawsynram**	**Total**
Fruit/vegetables	8 (25.81%)	14 (45.16%)	22 (70.97%)
Animal protein	6 (7.41%)	0	6 (19.35%)
No food prescribed	0	3 (9.68%)	3 (9.68%)
Total	14 (45.16%)	17 (54.84%)	31 (100%)
Supplementary food for good health	**Mawpat**	**Mawsynram**	**Total**
Homemade	6 (19.35%)	11 (35.48%)	17 (54.84%)
Commercialized	6 (19.35%)	3 (9.68%)	9 (29.03%)
No food supplement	2 (6.45%)	3 (9.68%)	5 (16.13%)
Total	14 (45.16%)	17 (54.84%)	31 (100%)
Medical supplement	**Mawpat**	**Mawsynram**	**Total**
Calcium, Iron, Folic	10 (32.26%)	13 (41.94%)	23 (74.19%)

acid			
Calcium, Iron, Folic acid, Vitamin, Zinc, Omega 3 fatty acid	3 (9.68%)	3 (9.68%)	6 (19.35%)
No medical supplement	1 (3.23%)	1 (3.23%)	2 (6.45%)
Total	14 (45.16%)	17 (54.84%)	31 (100%)

The table depicts the pre natal food practices followed by the pregnant mothers of Mawpat and Mawsynram block of East Khasi Hills District. The data revealed that out of 45 pregnant mothers, 31 (70.45%) received advice on pre natal food practices while 14 (29.55%) pregnant mothers did not receive advice on prenatal food practices. Notably, it is found that out of 31 mothers who received advice on food practices majority of the women belongs to Mawsynram block (37.78%) followed by Mawpat block (31.11%). On the basis of the responses received from the pregnant mothers on receiving any advice on food and diet it was found that it was mostly the ASHA workers or the doctors or the elderly family member who used to give advice on diet or food practices. It was found that out 31 pregnant mothers, 24 (77.42%) pregnant mothers received advice from ASHA/ doctor and 7 (22.58%) received advice from elderly family member and also from ASHA. It was found that majority of the pregnant mothers from both the blocks received advice from ASHA and Doctor. Interestingly, 2 (12.90%) pregnant mothers from Mawpat block and 3 (9.68%) pregnant mothers from Mawsynram block received advice from elderly family member and also from ASHA. Meanwhile, out of 31 pregnant mothers, majority of the pregnant mothers (83.87%) did not follow any restrictions on food during pregnancy with the highest number of pregnant mothers 14 (45.16%) from Mawsynram block, followed by Mawpat block 12 (38.71%). The study showed that the restriction of food on pregnant mothers is low with restrictions found only on spicy food, bitter gourd and papaya or pineapple during pregnancy. It was found that only 2 (6.45%) pregnant mothers from Mawsynram block were restricted to have spicy food during pregnancy and 1 (3.23%) pregnant mother from Mawpat block was restricted to have bitter gourd. Whereas, equal percentages of pregnant mothers that is 3.23%) from both Mawpat and Mawsynram block was restricted to have either papaya or pineapple during their pregnancy.Moreover, when asked about the food prescribed during pregnancy period the highest number of pregnant mothers (70.97%) responded that they were prescribed to take fruits and vegetables during pregnancy with higher percentages of mothers from Mawsynram block (45.16%) followed by Mawpat block (25.81%). Also, 6 (7.41%) mothers from Mawpat block were advised to consume animal protein of any kind for their healthy pregnancy and 3 (9.68%) pregnant mothers from Mawsynram block responded that they were not prescribed to take any special kind of food during their pregnancy. The study also revealed thatmajority of pregnant women (54.84%) take homemade food such as soup, fruit juice or local rice as source of food supplement with highest percentages of mothers found from Mawsynram block (35.48%) that Mawpat block (19.35%). Meanwhile, 6 (19.35%) pregnant

mothers from Mawpat block and 3 (9.68%) from Mawsynram block take commercialized food such as horlicks, fortified food, eggs, and toned milk. Whereas, 5 (16.13%) pregnant mothers from both the blocks did not take any food supplement during their pregnancy period. When asked about taking of any medicine supplement from the pregnant mothers, total of 23 (74.19%) pregnant women were found to take calcium, iron, and folic acid; 6 (19.35%) pregnant women take calcium, iron, folic acid, vitamin, zinc and omega 3 fatty acid with higher percentages of mothers recorded from Mawsynram block (approximately 55.17%) than Mawpat block (approximately 44.83%). Also, 1 (3.23%) pregnant mother from both the block responded that she is not taking any medicine supplements.

Table 60: Auxiliary Pre-Natal Health-Care Practices among the Pregnant Mothers of Mawpat and Mawsynram block of East Khasi Hills

Exercise/Activities	Mawpat	Mawsynram	Total
Yes	12 (26.67%)	9 (20%)	21 (46.67%)
No	11 (24.44%)	13 (28.89%)	24 (53.33%)
Total	23 (51.11%)	22 (48.89%)	45 (100%)

The table shows the auxiliary prenatal health care practices followed by the pregnant mothers of both Mawpat and Mawsynram block. It was found that 21 (46.67%) pregnant mothers received advice on exercise/activities to be followed during pregnancy while 24 (53.33%) pregnant did not receive any advice on exercise/ activities. The normal daily exercises which were advised to the pregnant mothers were either they were advised to take a proper walk on a daily basis or they were advised to do normal daily household chores or activities. On that basis, it was found that out of 12 advised pregnant mothers in Mawpat block 11 were advised to do normal daily household chores and 1 was advised walking. Whereas, out of 9 advised pregnant mothers in Mawsynram block 7 were advised to do normal daily household chores while, 2 were advised walking. Among the 21 pregnant mothers who were advised any type of prenatal health care were found to be either suffering from high blood pressure or lower back pain or weight gain or anaemia or may be due to multiple complications.

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Table 61: Age Group Wise Haemoglobin category of Pregnant Mothers (WHO, 1968) of Mawpat and Mawsynram block of East Khasi Hills

Mawpat						Mawsynram					
Age Group	**Normal (11 orhigher)**	**Mild Anaemia (10.0-10.9)**	**Moderate Anaemia (7.0-9.9)**	**Severe Anaemia (lower than 7.0)**	**Total**	**Age group**	**Normal (11 or higher)**	**Mild Anaemia (10.0-10.9)**	**Moderate Anaemia (7.0-9.9)**	**Severe Anaemia (lower than 7.0)**	**Total**
17 – 27	2 (9.52%)	2 (6.52%)	7 (33.33%)	0	11 (52.38%)	**17 – 27**	7 (33.33%)	1 (4.76%)	3 (14.28%)	0	11 (52.38%)
28 – 38	5 (23.81%)	1 (4.76%)	3 (14.29%)	0	9 (42.86%)	**28 – 38**	4 (19.05%)	2 (9.52%)	3 (14.28%)	0	9 (42.86%)
39 – 49	1 (4.76%)	0	0	0	1 (4.76%)	**39 – 49**	1 (4.76%)	0	0	0	1 (4.76%)
Total	8 (38.10%)	3 (14.29%)	10 (47.62%)	0	21 (100%)	**Total**	12 (57.15%)	3 (14.28%)	6 (28.57%)	0	21 (100%)

N.B. Total women = 351, Total pregnant women = 45 (23+22). Two pregnant mothers from Mawpat block and one pregnant mother from Mawsynram block did not alloweddoinghaemoglobin assessment

The above table illustrates the age group – wise distribution of pregnant mothers based on their haemoglobin level categories in the Mawpat and Mawsynram blocks of East Khasi Hills. Out of the total 45 studied mothers, 20 (approximately 44.44%) were classified as normal in terms of haemoglobin level, with 38.10% from Mawpat block and 57.15% from Mawsynram block. This suggests that the majority of mothers across both blocks fall within healthy haemoglobin range. However, in both the block prevalence of moderate anaemia can be noticed indicating that mothers are anaemic with 47.62% from Mawpat block and 28.57% from Mawsynram block creating a burden in the population.When analyzed by age groups, it was noticed that in 17 – 27 years age group, Mawpat block reported a higher percentage of mild anaemic cases (6.52%) compared to 4.76% in Mawsynram block signifying a risk of low haemoglobin level among them. Conversely, in the 28 – 38 years age group, Mawpat and Mawsynram reported equal proportion of moderately anaemic mothers (14.28%). A similar pattern was observed in the 39 – 49 years age group, where Mawpat and Mawsynram recorded equal number of midly anaemic cases.While no pregnant mothers were reported to be severely anaemic from Mawpat and Mawsynram block.

Section B

Lactating Mothers of Khasi Community of East Khasi Hills

Table 62: Duration of Breast-Feeding Practice among Lactating Mothers of Mawpat and Mawsynram block of East Khasi Hills

Place	Duration of Breast Feeding							
	Age group (in months)							
	0-6	7-12	13-18	19-24	24-30	31-36	37-42	Total
Mawpat	23 (58.97%)	21 (45.65%)	8 (44.44%)	6 (50%)	2 (66.67%)	2 (66.67%)	1 (100%)	63 (51.64%)
Mawsynram	16 (41.03%)	25 (54.35%)	10 (55.56%)	6 (50%)	1 (33.33%)	1 (33.33%)	0	59 (48.36%)
Total	39 (31.97%)	46 (37.70%)	18 (14.75%)	12 (9.84%)	3 (2.46%)	3 (2.46%)	1 (0.82%)	122 (100%)

The table above illustrates the duration of breastfeeding practices among lactating mothers. The total duration was categorized into seven groups: 0–6 months, 7–12 months, 13–18 months, 19–24 months, 25–30 months, 31–36 months, and 37–42 months. A total of 122 lactating mothers were included in the analysis—63 from Mawpat block and 59 from Mawsynram block.Among all participants, the highest proportion of mothers (37.70%) reported breastfeeding for 7–12 months, with Mawsynram block showing a notably higher frequency (54.35%) within this category. Meanwhile, 31.97% of mothers breastfed their children for 0–6 months, with Mawpat block contributing the majority (58.97%) compared to 41.03% from Mawsynram.A total of 18 mothers (14.75%) reported a breastfeeding duration of 13–18 months, with 44.44% from Mawpat and 55.56% from Mawsynram. In the 19–24 months category, only 12 mothers were reported (9.84%), with equal representation from both blocks.

Overall, the data reflect a decline in breastfeeding duration beyond one year, with a majority of mothers discontinuing breastfeeding within the first year of the child's life. This trend indicates a need for enhanced awareness and support for optimal breastfeeding practices, particularly in promoting breastfeeding beyond the first year in line with global health recommendations.

Table 63: Distribution of the Children underExclusive Breast Feeding (up to 6 months) in Mawpat and Mawsynram block of East Khasi Hills

Area	Total
Mawpat	23 (48.94%)
Mawsynram	24 (51.06%)

Total	47 (100%)

The above table presents the distribution of children under exclusive breastfeeding (up to six months of age). A total of 47 children were included in the study, with 23 (48.94%) from Mawpat block and 24 (51.06%) from Mawsynram block.The nearly equal distribution of children from both blocks indicates a comparable level of awareness and practice of exclusive breastfeeding among mothers in the two areas. Although the difference in numbers is marginal, Mawsynram block shows a slightly higher proportion of children exclusively breastfed, suggesting a slightly better adherence to recommended infant feeding practices in that block.

Table 64: Initiation of Breast-Feeding Practice among Lactating Mothers of Mawpat and Mawsynram block of East Khasi Hills

Initiation of Breast Feeding	Mawpat	Mawsynram	Total
Immediately after birth	60 (95.24%)	51 (86.44%)	111 (90.98%)
After 24 hours of birth	2 (3.17%)	8 (13.56%)	10 (8.20%)
A few days after birth	1 (1.59%)	0	1 (0.82%)
Total	63 (51.64%)	59 (48.36%)	122 (100%)

The above table presents data on the initiation of breastfeeding practices among lactating mothers from Mawpat and Mawsynram blocks in the East Khasi Hills district of Meghalaya. Three categories of breastfeeding initiation were observed among Khasi mothers: immediately after birth, after 24 hours of birth, and a few days after birth.A total of 122 lactating mothers were included in this analysis—63 (51.64%) from Mawpat and 59 (48.36%) from Mawsynram. The findings reveal that a large majority (90.98%) of mothers initiated breastfeeding immediately after birth, which is in line with WHO recommendations. This positive trend was especially notable in Mawpat, where 95.24% of mothers reported immediate initiation, compared to 86.44% in Mawsynram.Only 10 mothers (8.20%) initiated breastfeeding after 24 hours of birth, with the majority from Mawsynram (8 mothers) and only 2 from Mawpat. Additionally, just one mother from Mawpat reported initiating breastfeeding a few days after birth, indicating that delayed initiation is rare in this population. The findings suggest a strong adherence to early initiation of breastfeeding among Khasi mothers, especially in Mawpat block. However, the slightly lower rate in Mawsynram may reflect differences in awareness, access to healthcare services, or cultural practices.

Table 65: Colostrum Feeding Practices among Lactating Mothers of Mawpat and Mawsynram block of East Khasi Hills

Feeding of Colostrums	Mawpat	Mawsynram	Total
Yes	60(95.24%)	24 (40.68%)	84 (68.85%)
No	3 (4.76%)	35 (59.32%)	38 (31.15%)
Total	63 (51.64%)	59 (48.36%)	122 (100%)

The above table presents the frequency of colostrum feeding practices among lactating mothers in Mawpat and Mawsynram blocks of the East Khasi Hills district. Out of a total of 122 lactating mothers, 84 (68.85%) reported feeding colostrum to their newborns. This includes a significantly higher proportion from Mawpat (95.24%), compared to only 40.68% from Mawsynram.Conversely, 38 mothers (31.15%) did not provide colostrum to their infants. Within this group, Mawsynram block accounted for the vast majority (59.32%), while only 4.76% of mothers from Mawpat reported not feeding colostrum.
The data indicate a high level of awareness and adherence to colostrum feeding in Mawpat block, reflecting better maternal knowledge, possibly due to more effective health education or institutional delivery support. In contrast, the low prevalence of colostrum feeding in Mawsynram block raises concerns and points to a gap in awareness, traditional beliefs, or lack of health counseling.

Table 66: Usage of Medicine Supplement during Lactation Period among the Mothers of Mawpat and Mawsynram block of East Khasi Hills

Providing of medicine supplement	Mawpat	Mawsynram	Total
Yes	34 (53.97%)	40 (67.80%)	74 (60.66%)
No	29 (46.03%)	19 (32.20%)	48 (39.34%)
Total	63 (51.64%)	59 (48.36%)	122 (100%)

The above table illustrates the use of medicinal supplements during the lactation period among mothers from Mawpat and Mawsynram blocks of the East Khasi Hills district. Out of a total of 122 mothers, 74 (60.66%) reported providing medicinal supplements to their children. Notably,

Mawsynram block showed a higher frequency (67.80%) of supplement use compared to Mawpat (53.97%).

Conversely, 48 mothers (39.34%) did not give any medicinal supplements to their children. In this case, Mawpat block accounted for a higher proportion (46.03%) than Mawsynram (32.20%).

The findings suggest that mothers in Mawsynram are more inclined to use medicinal supplements during lactation, possibly reflecting better access to healthcare services, greater influence of health workers, or higher trust in biomedical interventions. On the other hand, the relatively lower usage in Mawpat may indicate either limited access, lack of awareness, or reliance on traditional practices.

Table 67: Usage of Food Supplement among Lactating Mothers and their Consultants in Mawpat and Mawsynram block of East Khasi Hills

Consulting Person	Mawpat			Mawsynram			Total		
	Homemade	Commercialized	Traditional	Homemade	Commercialized	Traditional	Homemade	Commercialized	Traditional
ASHA/ Doctor	1 (11.11%)	12 (60%)	0	0	20 (64.52%)	0	1 (7.69%)	32 (62.75%)	0
Untrained Birth Attendant	0	0	0	0	1 (3.23%)	1 (20%)	0	1 (1.96%)	1 (10%)
Elderly Family Member	4 (44.44%)	4 (20%)	3 (60%)	3 (75%)	8 (25.81%)	3 (60%)	7 (53.85%)	12 (23.53%)	6 (60%)
Traditional Healer	1 (11.11%)	1 (5%)	2 (40%)	0	0	1 (20%)	1 (7.69%)	1 (1.96%)	3 (30%)
Self	3 (33.33%)	3 (15%)	0	1 (25%)	2 (6.45%)	0	4 (30.77%)	5 (9.80%)	0
Total	9 (100%)	20 (100%)	5 (100%)	4 (100%)	31 (100%)	5 (100%)	13 (100%)	51 (100%)	10 (100%)

The above table presents data on the use of food supplements among lactating mothers and the sources of recommendation in Mawpat and Mawsynram blocks of the East Khasi Hills district. The food supplements reported in this study were categorized into three types: home-made, commercialised, and traditional Khasi supplements.

Among the participants, 13 mothers used home-made food supplements. Of these, the majority (53.85%) received recommendations from elderly family members, while 30.77% were self-initiated. Only one mother from Mawpat was advised by an ASHA worker to use home-made supplements.51 mothers used commercialised food supplements, making this the most common category. The

Majority (62.75%, i.e., 32 mothers) were recommended by ASHA workers, followed by 23.53% (12 mothers) who were advised by elderly family members. A small number (9.80% or 5 mothers) opted for commercialised supplements on their own. Only 10 mothers used traditional Khasi food supplements, most of whom (60%) received recommendations from elderly family members, while 3 cases were advised by traditional healers.

The findings reflect a clear pattern of influence in the use of food supplements among lactating mothers. Elderly family members play a crucial role in promoting home-made and traditional food supplements, drawing from cultural practices and intergenerational knowledge. In contrast, ASHA workers and local medical practitioners primarily advocate for commercialised supplements, aligning with modern healthcare practices and government nutritional programs.

This contrast indicates a coexistence of traditional and modern influences in maternal nutrition. To ensure safe and balanced dietary practices, health interventions should consider both cultural beliefs and biomedical recommendations, promoting a holistic and respectful approach to maternal care.

Table 68: Frequency of Breast Feeding Practices among Lactating Mothers of Mawpat and Mawsynram block of East Khasi Hills

Frequency	Age Group (In Months)												
	0-6 Months		7-12 Months		13-18 Months		19-24 Months		25-30 Months		30 Months and Above		Total
	Mawpat	Maws-ynram	Mawpat	Maws-ynram	Mawpat	Maws-ynram	Mawpat	Maws-ynram	Mawpat	Maws-ynram	Mawpat	Maws-ynram	
Every 1 Hr	7 (50%)	2 (14.29%)	3 (21.43%)	0	0	1 (7.14%)	1 (7.14%)	0	0	0	0	0	14 (11.48%)
Every 2 Hrs	7 (16.67%)	6 (14.29%)	6 (14.29%)	9 (21.43%)	3 (7.14%)	4 (9.52%)	1 (2.38%)	3 (7.14%)	1 (2.38%)	0	1 (2.38%)	1 (2.38%)	42 (34.43%)
Every 3 Hrs	0	1 (7.14%)	5 (35.71%)	4 (28.57%)	2 (14.29%)	1 (7.14%)	1 (7.14%)	0	0	0	0	0	14 (11.48%)
Every 4 Hrs	1 (33.33%)	0	1 (33.33%)	1 (33.33%)	0	0	0	0	0	0	0	0	3 (2.46%)
Whenever baby cries	8 (17.39%)	7 (15.22%)	5 (10.87%)	10 (21.74%)	3 (6.52%)	4 (8.70%)	3 (6.52%)	3 (6.52%)	1 (2.17%)	1 (2.17%)	1 (2.17%)	0	46 (37.70%)
Only at night	0	0	1 (33.33%)	1 (33.33%)	0	0	0	0	0	0	1 (33.33%)	0	3 (2.46%)
Total	23 (18.85%)	16 (13.11%)	21 (17.21%)	25 (20.49%)	8 (6.56%)	10 (8.20%)	6 (4.92%)	6 (4.92%)	2 (1.64%)	1 (0.82%)	3 (2.46%)	1 (0.82%)	122 (100%)

The table illustrates the breastfeeding frequency among lactating mothers across different child age groups in Mawpat and Mawsynram blocks of East Khasi Hills district. The mothers were grouped based on the age of their children: 0–6 months, 7–12 months, 13–18 months, 19–24 months, 25–30 months, and above 30 months. In the 0–6 months age group, 23 mothers from Mawpat and 16 from Mawsynram were included. In Mawpat, an equal number of mothers breastfed their infants either every 1 hour or every 2 hours, while 8 mothers (12.39%) reported breastfeeding whenever the baby cried. In contrast, in Mawsynram, 12 mothers practiced 1-hour interval feeding, while 6 (14.29%) followed a 2-hour interval. Interestingly, the highest proportion (15.22%) in this group preferred feeding on demand—i.e., whenever the baby cried. For the 7–12 months group, 21 mothers from Mawpat and 25 from

Mawsynram were studied. The majority of Mawpat mothers (14.29%) breastfed every 2 hours, followed by 10.87% who breastfed on demand. In Mawsynram, almost equal proportions of mothers fed every 2 hours (21.43%) and on demand (21.74%). Among mothers with children aged 13–18 months (8 from Mawpat, 10 from Mawsynram), 7 mothers in total practiced 2-hour interval feeding (7.14% from Mawpat and 9.52% from Mawsynram), while 6 mothers breastfed on demand (6.52% from Mawpat and 8.70% from Mawsynram). A small number (3 mothers) reported feeding every 3 hours (2 from Mawpat and 1 from Mawsynram). In the 19–24 months category, 6 mothers from each block were included. All 12 mothers (6.52% from each block) reported breastfeeding their children whenever they cried. Additionally, 4 mothers (1 from Mawpat and 3 from Mawsynram) followed a 2-hour feeding interval.

For children aged 25–30 months, 3 mothers were reported from each block. Out of these, 2 mothers (1 from each block) practiced on-demand feeding. Lastly, in the above 30 months group, 4 mothers (2 from each block) were included, with 2 mothers (1 from each block) continuing breastfeeding every 2 hours. The overall analysis of 122 lactating mothers revealed that on-demand breastfeeding—feeding whenever the child cries—is the most common practice (37.70%). This was followed by scheduled feeding every 2 hours, practiced by 34.43% of mothers. Feeding every 1 hour or every 3 hours was considerably less common, each practiced by 11.48% of mothers.

These findings suggest that responsive feeding, or feeding based on the infant's cues rather than a rigid schedule, remains a prevalent and culturally embedded practice in both Mawpat and Mawsynram blocks, especially among mothers with younger children. The data also reflect a gradual decrease in feeding frequency as the age of the child increases, indicating a natural transition away from exclusive or frequent breastfeeding as complementary feeding becomes more established.

Table 69:Occupation Wise Distribution of the Lactating Mothers regarding the Desired Duration of Breast Feeding of the Baby of Mawpat and Mawsynram block of East Khasi Hills

Occupation	Duration of Breast Feeding (age in months)															
	6 Months		7 Months		12 Months		18 Months		24 Months		36 Months		As long as the baby wants		Cannot Say	
	Mawpat	Mawsynram	Mawpat	Mawsynram	Mawpat	Mawsynram	Mawpat	Mawsynram	Mawpat	Mawsynram	Mawpat	Mawsynram	Mawpat	Mawsynram	Mawpat	Mawsynram
AGL/ DWL/ Farmer	1 (3.85 %)	1 (5.56%)	0	0	0	0	0	0	0	0	0	0	1 (8.33 %)	1 (8.33%)	0	2 (12.50 %)
Housew	24	17	2	0	5	6	2	4 (80%)	0	1	0	0	9	10	11	14

ife	(92.31%)	(94.44%)	(100%)		(100%)	(100%)	(66.67%)			(100%)			(75%)	(83.33%)	(78.57%)	(87.50%)
Business	0	0	0	0	0	0	0	0	0	0	0	0	1 (8.33%)	0	1 (7.14%)	0
Service	1 (3.85%)	0	0	0	0	0	1 (33.33%)	1 (20%)	1 (100%)	0	0	1 (100%)	1 (8.33%)	1 (8.33%)	1 (7.14%)	0
Total	26 (100%)	18 (100%)	2 (100%)	0	5 (100%)	6 (100%	3 (100%)	5 (100%)	1 (100%)	1 (100%)	0	1 (100%)	12 (100%)	12 (100%)	14 (100%)	16 (100%)
East Khasi Hills District (2 blocks)	44 (36.07%)		2 (1.64%)		11 (9.02%)		8 (6.56%)		2 (1.64%)		1 (0.82%)		24 (19.67%)		30 (24.59%)	

Further analysis was conducted on the breastfeeding practices of lactating mothers from the two selected blocks of East Khasi Hills. This analysis focused on understanding the mothers' preferred duration of breastfeeding in relation to their occupational status. The total duration of breastfeeding was classified into eight categories: 6 months, 7 months, 12 months, 18 months, 24 months, 36 months, as long as the baby wants, and cannot say.

Among the respondents, a total of 44 mothers (36.07%) expressed their desire to breastfeed their child up to six months. Notably, the majority within this group—41 mothers—were housewives, indicating a strong inclination among non-working mothers towards adhering to the six-month recommendation. Only 2 mothers (1.64%) stated their intention to breastfeed for up to seven months, both of whom were also housewives. A total of 11 mothers (9.02%), all housewives, preferred to breastfeed their children for a duration of up to 12 months.

Interestingly, 8 mothers expressed the intention to continue breastfeeding up to 18 months. Out of these, 6 were housewives and 2 were employed, suggesting that working mothers—likely with higher educational exposure—may be more aware of the extended nutritional benefits of breast milk. Breastfeeding up to 24 months was desired by only 2 mothers: one housewife from Mawsynram

and one working mother from Mawpat. Similarly, just one working mother from Mawsynram reported her intention to breastfeed her child up to 36 months.A noteworthy 24 mothers (19.67%) out of 122 shared that they would prefer to breastfeed their children "as long as the baby wants," reflecting a more flexible, child-led approach. On the other hand, 30 mothers (24.59%) could not express any clear opinion regarding the preferred duration of breastfeeding.

Table 70: Hygienic Practices related to Breast Feeding Behavior among Lactating Mothers of Mawpat and Mawsynram block of East Khasi Hills

Cleaning of baby after breast feeding	**Mawpat**	**Mawsynram**	**Total**
Always after feeding	19(30.16%)	38 (64.41%)	57 (46.72%)
Some convenient time after feeding	28 (44.44%)	11 (18.64%)	39 (31.96%)
Never	16 (25.40%)	10 (16.95%)	26 (21.31%)
Total	63 (51.64%)	59 (48.36%)	122 (100%)
Preferable position to breast feed the baby	**Mawpat**	**Mawsynram**	**Total**
Sitting	7 (11.11%)	9 (15.25%)	16 (13.11%)
Lying	8 (12.70%)	14 (23.73%)	22 (18.03%)
Both sitting and lying	48 (76.19%)	36 (61.02%)	84 (68.85%)
Total	63	59	122 (100%)
Mothers opinion of sufficiency of breast milk to the daily demand of the baby	**Mawpat**	**Mawsynram**	**Total**
Yes	39 (61.90%)	17 (28.81%)	56 (45.90%)
No	24 (38.10%)	42 (71.19%)	66 (54.10%)
Total	63 (51.64%)	59 (48.36%)	122 (100%)

The present analysis explores hygiene practices associated with breastfeeding among 122 lactating mothers from the Mawpat and Mawsynram blocks of East Khasi Hills district, Meghalaya. Three key variables were considered: cleaning of the baby after breastfeeding, the preferred breastfeeding position, and the mother's perception regarding the sufficiency of breast milk to meet the baby's daily demand.

Findings reveal that the highest proportion of mothers (46.72%) reported cleaning their babies immediately after breastfeeding, with a notably higher frequency in Mawsynram (64.41%) compared to Mawpat (30.16%). Additionally, 31.96% of mothers preferred to clean their babies at a more convenient time, a practice more common in Mawpat (44.44%). Alarmingly, 21.31% of respondents admitted to never cleaning their babies after breastfeeding.

Regarding breastfeeding positions, the majority of Khasi mothers preferred both sitting and lying positions interchangeably. Specifically, 18.03% identified lying as the preferred position, while 13.11% preferred sitting.

In terms of perceived breast milk adequacy, 54.10% of the mothers believed that their breast milk was insufficient to meet their child's daily nutritional needs. This perception was particularly pronounced among mothers from Mawsynram (71.19%) compared to Mawpat (38.10%). Conversely, a greater proportion of mothers from Mawpat reported their breast milk to be sufficient.

Table 71: Food Practices among the Lactating Mothers of Mawpat and Mawsynran block of East Khasi Hills

Special Food in daily diet to enhance milk production	**Mawpat**	**Mawsynram**	**Total**
Yes	19 (30.16%)	17 (28.81%)	36 (29.51%)
No	44 (69.84%)	42 (71.19%)	86 (70.49%)
Total	63 (51.64%)	59 (48.36%)	122 (100%)
Medicine Supplement other than daily diets	**Mawpat**	**Mawsynram**	**Total**
Yes	16 (25.40%)	32 (54.24%)	48 (39.34%)
No	47 (74.60%)	27 (45.76%)	74 (60.66%)
Total	63 (51.64%)	59 (48.36%)	122 (100%)
Beneficiary of Supplementary Nutritional Programme	**Mawpat**	**Mawsynram**	**Total**
Yes	51 (80.95%)	55 (93.22%)	106 (86.89%)
No	12 (19.05%)	4 (6.78%)	16 (13.11%)
Total	63 (51.64%)	59 (48.36%)	122 (100%)

The present analysis examines food-related practices among lactating mothers from Mawpat and Mawsynram blocks in the East Khasi Hills district of Meghalaya. The key variables considered include: (1) inclusion of special foods in the daily diet to enhance breast milk production, (2) use of medicinal supplements apart from the regular diet, and (3) enrolment in supplementary nutritional programmes.

With regard to special food intake for enhancing breast milk production, a majority of respondents (70.49%) reported not incorporating any such foods in their daily diet. This trend was slightly more prevalent in Mawsynram (71.19%) compared to Mawpat (69.84%). Conversely, only 29.51% of the mothers reported consuming special foods, with a marginally higher frequency observed in Mawpat (30.16%) than in Mawsynram (28.81%).

In terms of medicinal supplementation beyond the daily diet, 39.34% of lactating mothers reported using such supplements. This practice was notably more common in Mawsynram (52.24%) than in Mawpat (25.40%). In contrast, 60.66% of the respondents did not use any medicinal supplements, with a significantly higher proportion from Mawpat (74.60%) compared to Mawsynram (45.76%).

Regarding participation in supplementary nutritional programmes, a substantial majority—106 out of 122 mothers (86.89%)—were enrolled in such schemes. A higher enrolment was recorded among mothers from Mawsynram (93.22%) as compared to those from Mawpat (80.95%). Consequently, non-enrolment in the programme was more pronounced in Mawpat, where 19.05% of mothers reported not being beneficiaries, compared to only 6.78% in Mawsynram.

Table 72: Place of Delivery of the Studied Children of Mawpat and Mawsynram block of East Khasi Hills

Place of delivery	Mawpat	Mawsynram	Total
Government Hospital	61 (35.67%)	53 (30.99%)	114 (66.67%)
Community Health Centre	0	3 (1.755)	3 (1.75%)
Primary Health Centre	1 (0.58%)	10 (5.84%)	11 (6.43%)
Sub-centre	0	0	0
Private Hospital	4 (2.34%)	1 (0.58%)	5 (2.92%)
Home	18 (10.53%)	20 (11.70%)	38 (22.22%)
Total	84 (49.12%)	87 (50.88%)	171 (100%)

The table presents the distribution of delivery places among the studied children from Mawpat and Mawsynram blocks in East Khasi Hills district. A total of 171 children were covered in the study, with 84 (49.12%) from Mawpat and 87 (50.88%) from Mawsynram. The data indicate that a majority of deliveries (66.67%) occurred in government hospitals, suggesting a notable inclination towards institutional births in public healthcare settings. This reflects either increasing awareness regarding safe childbirth practices or improved accessibility and affordability of public health services. Mawpat recorded slightly more deliveries in government hospitals (35.67%) compared to Mawsynram (30.99%). Home deliveries accounted for 22.22% of total births, with a marginally higher proportion observed in Mawsynram (11.70%) compared to Mawpat (10.53%). The persistence of home births may point to cultural preferences, inadequate access to health facilities, transportation challenges, or limited trust in institutional care, particularly in remote areas. Deliveries at Primary Health Centres (PHCs) and Community Health Centres (CHCs) were relatively low, accounting for 6.43% and 1.75% respectively. This suggests that despite their intended role in rural healthcare infrastructure, these facilities may be underutilized for childbirth, possibly due to limited resources, manpower, or perceived quality of care. Interestingly, no deliveries were recorded at Sub-centres in either block, emphasizing the limited role of these grassroots-level institutions in handling childbirth, which is often due to lack of trained personnel or delivery infrastructure.

Table 73: Birth Weight of the Studied Children of Mawpat and Mawsynram block of East Khasi Hills

Birth weight (in kg)	Mawpat	Mawsynram	Total
1 – 2.0	3 (1.73%)	1 (0.58%)	4 (2.31%)
2.1 – 3.0	41 (23.70%)	45 (26.01%)	86 (49.71%)
3.1 – 4.0	35 (20.23%)	40 (23.12%)	75 (43.35%)
4.1 – 5.0	1 (0.58%)	0	1 (0.58%)
Didn't measure	0	0	0
Don't remember	6 (3.47%)	1 (0.58%)	7 (4.05%)
Total	86 (49.71%)	87 (50.29%)	173 (100%)

The table outlines the distribution of birth weights among 173 studied children from the Mawpat (n = 86) and Mawsynram (n = 87) blocks of East Khasi Hills district.The majority of children (49.71%) were born with a birth weight between 2.1 – 3.0 kg, which is considered within the normal range by WHO standards. Mawsynram reported slightly more children in this category (26.01%) than Mawpat (23.70%). A considerable proportion (43.35%) of the children had a birth weight between 3.1 – 4.0 kg, indicating good maternal health and likely adequate prenatal care in many cases. This proportion was nearly evenly distributed between the two blocks — 20.23% from Mawpat and 23.12% from Mawsynram. However, low birth weight (1 – 2.0 kg) was observed in 2.31% of the total children, with 3 cases (1.73%) in Mawpat and 1 case (0.58%) in

Mawsynram. Although relatively small in number, low birth weight is a critical indicator of poor intrauterine growth, maternal malnutrition, or complications during pregnancy and delivery. Only one child (0.58%) in Mawpat had a birth weight above 4 kg, while no children were recorded in this category in Mawsynram. This is within expected limits for the general population. A small proportion of respondents (4.05%) reported that they did not remember the birth weight of their child. No respondents reported that the birth weight was not measured.

The findings suggest that most children were born with a normal or above-average birth weight, which may reflect relatively stable maternal health and nutrition in the studied areas. However, the presence of low-birth-weight cases, though limited, warrants attention as it can have long-term health implications for the child.

Section C

Child feeding practices (children up to 3 years of age) of the Khasi Community of East Khasi Hills.

Table 74: Food and Dietary Practices of the Studied Children of Mawpat and Mawsynram block of East Khasi Hills

Daily Diet			
Daily diet	**Mawpat**	**Mawsynram**	**Total**
Exclusive breast feeding	21 (12.14%)	20 (11.56%)	41 (23.70%)
Composite feeding	38 (21.97%)	37 (21.39%)	75 (43.35%)
Milk supplement	1 (0.58%)	0	1 (0.58%)
Normal adult diet	26 (15.03%)	30 (17.34%)	56 (32.37%)
Total	86 (49.71%)	87 (50.29%)	173 (100%)
Frequency of having breast milk (per day) in case of Exclusive Breast Feeding			
Frequency (in hours)	**Mawpat**	**Mawsynram**	**Total**
1 hour	7 (17.07%)	2 (4.88%)	9 (21.95%)
2 hours	4 (9.76%)	4 (9.76%)	8 (19.51%)
3 hours	0	7 (17.07%)	7 (17.07%)
4 hours	0	2 (4.88%)	2 (4.88%)
Whenever the child wants	10 (24.39%)	5 (12.20%)	15 (36.59%)
Total	21 (51.22%)	20 (48.78%)	41 (100%)
Age at which the composite diet is introduced to children			
Month at which semi – solid food was	**Mawpat**	**Mawsynram**	**Total**

introduced			
0 – 5 months	6 (8%)	11 (14.67%)	17 (22.67%)
6 – 10 months	30 (40%)	24 (32%)	54 (72%)
11 months and above	2 (2.67%)	2 (2.67%)	4 (5.33%)
Total	38 (50.67%)	37 (49.33%)	75 (100%)
Type of Semi Solid Food in CompositeDiet			
Type of foods	**Mawpat**	**Mawsynram**	**Total**
Commercialized	3 (4%)	7 (9.33%)	10 (13.33%)
Home made	26 (34.67%)	19 (25.33%)	45 (60%)
Commercialized+ Home made	9 (12%)	12 (16%)	21 (28%)
Total	38 (50.67%)	37 (49.33%)	75 (100%)
The Frequency of having semi – solid food (Composite Diet)			
Frequency (per day)	**Mawpat**	**Mawsynram**	**Total**
1 times	1 (1.33%)	0	1 (1.33%)
2 times	29 (38.67%)	21 (28%)	50 (66.67%)
3 times	5 (6.67%)	13 (17.33%)	18 (24%)
4 – 5 times	3 (4%)	3 (4%)	6 (8%)
Total	38 (50.67%)	37 (49.33%)	75 (100%)
Age of Discontinuation of Breastfeeding Among Children(Normal Adult Diet)			
Age of discontinued breastfeeding (months)	**Mawpat**	**Mawsynram**	**Total**
0 – 5 months	5 (8.93%)	3 (5.36%)	8 (14.29%)
6 – 10 months	4 (7.14%)	8 (14.29%)	12 (21.43%)
11 months and above	17 (30.36%)	19 (33.93%)	36 (64.29%)
Total	26 (46.43%)	30 (53.57%)	56 (100%)
Supplementary Feeding Practices Among Children			
Food supplements	**Mawpat**	**Mawsynram**	**Total**
Commercialized tinned milk	16 (9.25%)	16 (9.25%)	32 (18.49%)
Homemade	23 (13.29%)	18 (10.40%)	41 (23.70%)
Commercialized + Homemade	4 (2.31%)	2 (1.16%)	6 (3.47%)
No food supplements	43 (24.86%)	51 (29.48%)	94 (54.34%)
Total	86 (46.71%)	87 (50.29%)	173 (100%)
Medicinal Supplementation Among Children			
Medicine	**Mawpat**	**Mawsynram**	**Total**

supplements			
Yes	56 (32.37%)	55 (31.79%)	111 (64.16%)
No	30 (17.34%)	32 (18.50%)	62 (35.84%)
Total	86 (49.71%)	87 (50.29%)	173 (100%)

The table presents data on the food and dietary practices of children up to three years old in Mawpat and Mawsynram blocks of East Khasi Hills.The data indicate that 23.70% of the studied children were exclusively breastfed. A slight difference was observed between the two blocks, with Mawpat block showing a higher prevalence (12.14%) compared to Mawsynram block (11.56%). This variation could be influenced by factors such as maternal education, cultural beliefs, healthcare accessibility, or economic conditions that affect breastfeeding practices. A significant proportion (43.35%) of children was dependent on composite feedingconsisting of both breast milk and semi-solid food with more or less similar percentages of children from both blocks. This dietary pattern indicates a transitional phase, where infants receive supplementary nutrition alongside breast milk to meet their growing energy and nutrient demands. Such a feeding approach aligns with standard infant feeding recommendations, ensuring adequate nourishment during early childhood development.However, a considerable number of children had transitioned to a normal adult diet. This trend was more pronounced in Mawsynram (17.34%) than in Mawpat (15.03%) suggesting early introduction to family meals, possibly due to food availability, parental feeding habits, or the need for mothers to resume work, making exclusive breastfeeding or separate meal preparation less feasible. Interestingly, only one child from the Mawpat block was reported to consume commercial milk supplements. This minimal usage suggests that traditional feeding practices, such as breastfeeding and home-prepared meals, remain the predominant choice among families in both blocks. The limited adoption of commercial milk supplements may be attributed to economic constraints, lack of awareness, or a preference for natural feeding methods.Regarding the frequency of breastfeeding among exclusively breastfed children, a total of 41 children from both blocks were considered (Mawpat = 21, Mawsynram = 20).Among them, the highest proportion (36.59%) children were breastfed on demand, meaning they were fedwhenever they needed with Mawpat showing the highest frequency (24.39%) suggesting a more flexible and responsive feeding approach in this region.Additionally, 21.95% children received breast milk every one hour, with a higher occurrence Mawpat (17.07%) compared to Mawsynram. This frequent feeding pattern may indicate greater reliance on breast milk as the primary source of nutrition in some households. Also, 19.51% children received breast milk every two hours with equal percentages (9.76%) from both the blocks indicating a structured feeding pattern.The variation in breastfeeding frequency between the two blocks highlights potential differences in caregiving practices, maternal availability, and cultural or lifestyle influences.

The table also analyzed the age at which a composite diet (breast milk along with semi-solid food) was introduced among 75 children from Mawpat (38 children) and Mawsynram (37 children). The findings reveal distinct trends in early feeding practices across the two regions. A

total of 17 children (22.67%) across both blocks were introduced to a composite diet between 0-5 months of age. Notably, a higher percentage of children from Mawsynram (14.67%) started consuming semi-solid food alongside breast milk at this early stage compared to Mawsynram. The early introduction of complementary foods might be influenced by maternal workload, lack of awareness about exclusive breastfeeding recommendations, or cultural feeding norms. While early supplementation may help in cases where breast milk supply is insufficient, it may also pose risks such as digestive issues and increased susceptibility to infections if not managed properly. The majority of children (72%) began their composite diet between 6-10 months, aligning with global infant feeding recommendations. Among them, Mawpat had a higher proportion (40%) compared to Mawsynram. This suggests that families in Mawpat might be following more structured weaning practices, gradually introducing semi-solid foods at an appropriate age to support the child's nutritional needs while continuing breastfeeding. The introduction of complementary foods at this stage is crucial for ensuring adequate energy intake and developmental growth.Only a small percentage of children (5.33%) started a composite diet at 11 months or later with both the blocks showing equal frequency (2.67%). This delayed introduction beyond 10 months might be due to prolonged exclusive breastfeeding, limited awareness of complementary feeding requirements, or economic constraints affecting food availability. While breast milk continues to provide essential nutrients, delayed weaning could impact the child's ability to adapt to solid foods and meet increasing nutritional demands.

The study examined the types of semi-solid food included in the composite diet of 75 children from Mawpat (38 children) and Mawsynram (37 children). The overall analysis highlights the preference for homemade over commercialized food among families in both regions.Among the studied children, only ten (13.33%) were completely dependent on commercialized semi-solid food, with a higher proportion in Mawsynram (7children) compared to Mawpat (3 children). Commercialized semi-solid foods, such as packaged baby cereals, are often marketed for their convenience and nutritional composition. However, limited access, affordability issues, and a preference for traditional feeding practices may have contributed to their low usage in these rural communities. A good proportion of children (28%) consumed a mix of both commercialized and homemade semi-solid food, with 9 children from Mawpat and 12 children from Mawsynram. This feeding pattern suggests that while some families incorporated commercial baby foods for convenience or supplementation, they still relied on homemade preparations as the primary source of nutrition. Factors such as maternal education, economic status, and exposure to commercial baby food products may have influenced this feeding choice. The majority of children (60%) were exclusively dependent on homemade semi-solid food in their composite diet. This trend reflects a strong preference for traditional, locally prepared foods over commercially available options. Homemade semi-solid foods, such as mashed rice, lentils, vegetables, and locally sourced porridges, are commonly introduced as complementary foods in these communities. These foods are often perceived as healthier, more affordable, and culturally appropriate, aligning with family dietary habits and available resources.

The study further analyzed the frequency of semi-solid food intake among 75 children from Mawpat (38 children) and Mawsynram (37 children) to understand the dietary patterns in complementary feeding. The findings indicate variations in feeding frequency between the two blocks, which may be influenced by factors such as parental knowledge, food availability, and cultural practices. The highest proportion of children (66.67%) consumed semi-solid food two times a day,a higher frequency was observed in Mawpat (38.67%) compared to Mawsynram (28%). While twice-daily feeding provides some nutritional supplementation, it may not be sufficient for children's optimal growth, especially as they transition from exclusive breastfeeding to solid foods. A considerable proportion (24%) of children was given semi-solid food thrice a day following a structured feeding routine. Among them, a higher frequency was observed in Mawsynram (17.33%) compared to Mawpat (6.67%).This pattern aligns with recommended complementary feeding guidelines, where introducing semi-solid food in regular meal intervals helps meet the child's increasing nutritional needs. The prevalence of thrice-daily feeding suggests that many caregivers in these communities recognize the importance of structured meal timing for their children's growth and development.The reasons for this feeding frequency could include maternal workload, food accessibility, or traditional feeding practices that emphasize continued breastfeeding alongside fewer solid meals.Only a small number of children (8%) consumed semi-solid food 4-5 times a day, with equal number of children that is 3 from both Mawpat and Mawsynram block. A higher frequency of semi-solid food intake suggests greater emphasis on ensuring adequate energy and nutrient intake, possibly in households where children had higher nutritional demands or reduced breast milk consumption. However, this practice remains uncommon, indicating that most caregivers follow a meal-based feeding pattern rather than offering frequent small portions throughout the day.The present study also examined the age at which breastfeeding was discontinued among 56 children who had transitioned to a normal adult diet. The sample included 26 children from Mawpat and 30 children from Mawsynram, providing insights into variations in weaning practices between the two blocks.A majority of children (64.29%) discontinued breastfeeding at 11 months or later, aligning with the recommended duration for extended breastfeeding. Among them, 33.93% were from Mawsynram, while 30.36% were from Mawpat. The higher percentage in Mawsynram suggests that caregivers in this region may prioritize prolonged breastfeeding, possibly due to cultural beliefs, awareness of its health benefits, or limited access to alternative nutrition sources.Extended breastfeeding can be beneficial for child immunity and overall development, particularly in resource-limited settings where supplementary nutrition may not always be optimal. A significant proportion (21.43%) of children stopped breastfeeding between 6-10 months. Interestingly, Mawsynram had a higher percentage (14.29%) of early weaning compared to Mawpat (7.14%). The earlier cessation of breastfeeding in Mawsynram might be influenced by maternal employment, early introduction of solid foods, or socio-economic factors that necessitate a shift to other dietary sources. While complementary feeding typically begins around six months, discontinuing breastfeeding too early may deprive infants of essential immune-boosting and nutritional benefits. Whereas, 8 children (14.29%)—five (8.93%) from Mawpat

block and 3 (5.36%) from Mawsynram block—discontinued breastfeeding as early as 0-5 months. Such early cessation is uncommon and could be due to factors such as maternal health issues, insufficient lactation, or reliance on alternative feeding methods like formula or animal milk.

This study also revealed the supplementary feeding practices among 173 children from East Khasi Hills, with 86 children from Mawpat and 87 children from Mawsynram. A significant proportion of children (54.34%) did not receive any form of supplementary food. This included 29.48% of children from Mawsynram and 24.86% of children from Mawpat. The high percentage of children without supplementary feeding suggests a reliance on primary dietary sources, including breastfeeding and family meals, without additional nutritional interventions. This trend may be influenced by economic constraints, limited awareness about supplementation, or cultural feeding practices. Again, 23.70% of children were given homemade food supplements, with Mawpat having a comparatively higher proportion (13.29%) than Mawsynram (10.40%). Homemade supplements typically include locally available nutrient-rich foods such as rice porridge, lentil soup, mashed vegetables, and fruit preparations. The preference for homemade supplements indicates that some caregivers recognize the importance of dietary diversification. About 18.49% of children were consuming commercialized supplementary food, with both the blocks showing equal frequency (9.25%). Commercial supplements often include formula milk, packaged baby cereals, and fortified foods. The present study examined the administration of medicinal supplements among 173 children from East Khasi Hills, including 86 children from Mawpat and 87 children from Mawsynram. Out of the total sample, 111 children (64.16%) reportedly received medicinal supplements, indicating a widespread practice of nutritional supplementation. Among them, 32.37% were from Mawpat, while 31.79% were from Mawsynram. The relatively high proportion of supplemented children suggests an active intervention to address potential micronutrient deficiencies, particularly in growing children. However, 35.84% of children did not receive any medicinal supplementation, which raises concerns about potential gaps in healthcare access or awareness regarding the benefits of such supplements.In most cases, the medicinal supplements provided included essential vitamins and minerals crucial for child growth and development. The commonly administered supplements wereVitamin A, D, and E, Calcium, Vitamin B12, Iron and Folic Acid etc. These supplements play a vital role in preventing nutritional deficiencies and ensuring the healthy growth of children, particularly in resource-limited settings where dietary diversity may be inadequate.The study found that most of these supplements were provided bygovernment health centres, emphasizing the role of public health initiatives in addressing child malnutrition. The distribution of these supplements through Anganwadi centres, public hospitals, and outreach programs indicates an organized approach to child healthcare.

Chapter 4

Morbidity, Mortality, Clinical Signs and Symptoms ofMawpat and Mawsynram Blocks of East Khasi Hills

Section A

Morbidity Status of the studied population of Mawpat and Mawsynram Block

Table 75: Cases of Major Morbidity among the Studied Population in East Khasi Hills District (Mawpat and Mawsynram block) (reference period of 12 months)

Diseases	No. of Cases (Mawpatblock)	No. of Cases (Mawsynram block)	East Khasi Hills (2 Blocks)
Piles	1 (3.57%)	0	1 (3.57%)
Hydrocephalus	1 (3.57%)	0	1 (3.57%)
Hip Operation	1 (3.57%)	0	1 (3.57%)
Uric Acid	1 (3.57%)	0	1 (3.57%)
Hepatic Cyst	1 (3.57%)	0	1 (3.57%)
Cyst in the Uterus	1 (3.57%)	0	1 (3.57%)
Operation of Adrenal Gland	1 (3.57%)	0	1 (3.57%)
Liver cirrhosis	1 (3.57%)	0	1 (3.57%)
Hernia	1 (3.57%)	0	1 (3.57%)
Gall Bladder Stone	1 (3.57%)	0	1 (3.57%)
Blood Vomit	0	1 (3.57%)	1 (3.57%)
High Blood Pressure	0	4 (14.29%)	4 (14.29%)
Diabetes	0	3 (10.71%)	3 (10.71%)
Low Blood Pressure	0	3 (10.71%)	3 (10.71%)
Pneumonia	0	1 (3.57%)	1 (3.57%)
Thyroid	0	1 (3.57%)	1 (3.57%)
Hole in Heart	0	1 (3.57%)	1 (3.57%)
Asthma	0	1 (3.57%)	1 (3.57%)
Cancer	0	1 (3.57%)	1 (3.57%)
Cardiovascular Disease	0	1 (3.57%)	1 (3.57%)
Kidney Stone	0	1 (3.57%)	1 (3.57%)
Total	10 (35.71%)	18 (64.29%)	28 (100%)

NB: illness suffered from more than 10 days and/ any hospitalization by the members of the household

The table presents the distribution of major morbidity cases among the individuals from the studied population in both Mawpat and Mawsynram blocks of the East Khasi Hills district. A total of 28 morbidity cases were recorded, with 10 cases reported from the Mawpat block and 18 from the Mawsynramblock.Among the various health conditions observed, high blood pressure emerged as the most frequently reported morbidity, accounting for 14.29% of all cases found only in Mawsynram. This was followed by diabetes and low blood pressure (10.71%), indicating a significant burden of non-communicable diseases within the adult population of both Mawsynram block.These findings suggest a wide spectrum of chronic and lifestyle-related health conditions affecting the population.

Interestingly, all the morbid conditions reported were found to be block-specific. In the Mawpat block, cases of piles (3.57%), hydrocephalus (3.57%), hip operation (3.57%), uric acid (3.57%), hepatic cyst (3.57%), cyst in uterus (3.57%), adrenal gland operation (3.57%), liver cirrhosis (3.57%), hernia (3.575), gallbladder stone (3.57%) were exclusively reported. On the other hand, the Mawpat block showed a distinct pattern with cases such as blood vomit (3.57%), pneumonia (3.57%), thyroid (3.57%), hole in heart (3.57%), asthma (3.57%), cancer (3.57%), cardiovascular diseases (3.57%) and kidney stone (3.57%) being reported only in that region.This variation in morbidity patterns between the two blocks may reflect differences in environmental exposures, healthcare access, occupational patterns, or socio-cultural factors, which merit further exploration.

Table 76: Cases of Minor Morbidity among the Ptudied population in East Khasi Hills District (Mawpat and Mawsynram Block) (reference period of 3 months)

Diseases	No. of Cases (Mawpat block)	No. of Cases (Mawsynram block)	East Khasi Hills (2 Blocks)
Fever	4 (12.90%)	17 (54.84%)	21 (67.74%)
Eye Infection	1 (3.23%)	0	1 (3.23%)
Chicken Pox	1 (3.23%)	0	1 (3.23%)
Migraine	0	4 (12.90%)	4 (12.90%)
Cold and Cough	0	3 (9.68%)	3 (9.68%)
Bulge in Neck	0	1 (3.23%)	1 (3.23%)
Total	6 (19.35%)	25 (80.65%)	31 (100%)

NB: illness suffered from less than 10 days by the members of the household

The table illustrates the distribution of minor morbidity cases among the individuals in the studied population of Mawpat and Mawsynram blocks within the East Khasi Hills District. A total of 31 minor morbidity cases were recorded, with 6 cases (19.35%) reported from

Mawpatblock and a comparatively higher number of 25 cases (80.65%) reported from Mawsynram block.

Among the various minor ailments, fever was the most frequently reported condition, accounting for 67.74% of all cases. Notably, the prevalence of fever was higher in Mawsynram block (54.84%) compared to Mawpat block (12.90%), indicating a possible variation in environmental or health-related factors between the two regions. Eye infection (3.23%) and chicken pox (3.23%) as a minor morbid case was only reported from Mawpat block. Also, migraine (12.90%), cold and cough (9.68%) and bulge in the neck (3.23%) was reported only from Mawsynram block. The observed differences in the pattern and frequency of minor morbidity between the two blocks highlight the need for block-specific public health interventions. Factors such as sanitation, water quality, climate variability, and access to primary healthcare services may play a role in shaping these health trends and should be examined further through focused field investigations.

Section B

Mortality Status of Adults and Children in Mawpat and Mawsynram Block of East Khasi Hills

Table 77: Neonatal, Infant and Child Mortality in Mawpat Block of East Khasi Hills (2021-2023)

Year	Neonatal Death (N = 6)		Infant Death (N = 12)		Child Death (N = 2)		Total (N = 20)	
	Male	Female	Male	Female	Male	Female	Male	Female
2021 – 2023	2 (10%)	4 (20%)	10 (50%)	2 (10%)	2 (10%)	0	14 (70%)	6 (30%)

N.B. 3 Still Births were reported from Mawpat block.

The above table depicts the cases of neonatal, infant and child mortality of less than 5 year old children in Mawpat block for three consecutive years. It can be understood from the table that a total of 20 children of less than 5 years died in different phases of development which depicted more male deaths (70%) than female deaths (30%) in Mawpat block. In case of neonatal mortality, 20% females died within 28 days of their birth which is quite higher than the male deaths (10%). Whereas, in case of infant mortality, 10% of females died within 12 months of their birth which is less than the infant deaths among the males (50%). Moreover, 10% males expired within 12 months to 59 months of their birth.

Table 78: Neonatal, Infant and Child Mortality in Mawsynram Block of East Khasi Hills (2021-2023)

Year	Neonatal Death (N = 2)	Infant Death (N = 13)	Child Death (N = 1)	Total (N = 16)

	Male	Female	Male	Female	Male	Female	Male	Female
2021 – 2023	2(22.22%)	0	7 (43.75%)	6 (37.50%)	1 (6.25%)	0	10 (62.50%)	6 (37.50%)

N.B. 7 Still Births were reported from Mawsynramblock.

The above table depicts the cases of neonatal, infant and child mortality of less than 5 year old children in Mawsynram block for three consecutive years. It can be understood from the table that a total of 16 children of less than 5 years died in different phases of development which depicted more male deaths (62.50%) than female deaths (37.50%) in Mawsynram block. In case of neonatal mortality, 22.22% males died within 28 days of their birth while no female deaths were recorded in that category. Whereas, in case of infant mortality, 43.75% of males died within 12 months of their birth which is higher than the infant deaths among the females (37.50%). Also, when child mortality is concerned, 6.25% male deaths were reported who expired within 12 months to 59 months of their birth.

Table 79: Disease/Cause Specific Neonatal, Infant and Child Mortality in Mawpat Block of East Khasi Hills (N: 20) (2021-2023)

Disease/ Cause	Neonatal Death		Infant Death		Child Death		All categories		
	Male	Female	Male	Female	Male	Female	Male	Female	Total
Fever	1 (5%)	1 (5%)	1 (5%)	0	0	0	2 (10%)	1 (5%)	3 (15%)
Nuchal cord	1 (5%)	0	0	0	0	0	1 (5%)	0	1 (5%)
Cough	0	0	1 (5%)	1 (5%)	1 (5%)	0	2 (10%)	1 (5%)	3 (15%)
Premature birth	0	0	2 (10%)	1 (5%)	0	0	2 (10%)	1 (5%)	3 (15%)
Vomiting and Dysentry	0	0	1 (5%)	0	0	0	1 (5%)	0	1 (5%)
Asthma	0	0	1 (5%)	0	0	0	1 (5%)	0	1 (5%)
Undiagnosed	0	3 (15%)	4 (20%)	0	1 (5%)	0	5 (25%)	3 (15%)	8 (40%)
Total	2 (10%)	4 (20%)	10 (50%)	2 (10%)	2 (10%)	0	14 (70%)	6 (30%)	20 (100%)

The table depicts disease or cause specific deaths among children of less than 5 years in Mawpat block. From the table it can be understood that higher percentages of children died because of any undiagnosed diseases (40%). Whereas, equal percentages of children expired because of

fever (15%), cough (15%) and premature birth (15%). Similarly, equal percentages of children expired because of nuchal cord (5%), vomiting and dysentery (5%), and asthma (5%).

Table 80: Disease/Cause Specific Neonatal, Infant and Child Mortality in Mawsynram Block of East Khasi Hills (N: 16) (2021-2023)

Disease/ Cause	Neonatal Death		Infant Death		Child Death		All categories		
	Male	Female	Male	Female	Male	Female	Male	Female	Total
Asthma	1 (6.25%)	0	1 (6.25%)	0	0	0	2 (12.50%)	0	2 (12.50%)
Breathing problem	0	0	1 (6.25%)	1 (6.25%)	0	0	1(6.25%)	1 (6.25%)	2 (12.50%)
Dysentery	0	0	1 (6.25%)	0	0	0	1 (6.25%)	0	1(6.25%)
Heart disease	0	0	0	1 (6.25%)	0	0	0	1(6.25%)	1(6.25%)
Fever	0	0	1 (6.25%)	0	1 (6.25%)	0	2 (12.50%)	0	2 (12.50%)
Jaundice	0	0	0	1 (6.25%)	0	0	0	1(6.25%)	1(6.25%)
Malaria	0	0	1 (6.25%)	0	0	0	1(6.25%)	0	1(6.25%)
Pneumonia	0	0	1 (6.25%)	1 (6.25%)	0	0	1 (6.25%)	1 (6.25%)	2 (12.50%)
Undiagnosed	1 (6.25%)	0	1 (6.25%)	2 (12.50%)	0	0	2 (12.50%)	2 (12.50%)	4 (25.00%)
Total	2 (12.50%)	0	7 (43.75%)	6 (37.5%)	1 (6.25%)	0	10 (62.50%)	6 (37.50%)	16 (100.00%)

The table depicts disease or cause specific deaths among the children of less than 5 years in Mawsynram block. From the table it can be understood that, higher percentages of children died because of any undiagnosed diseases (25%). While, equal percentages of children succumbed to death because of asthma (12.50%), breathing problem (12.50%), fever (12.50%) and pneumonia (12.50%). Similarly, equal percentages of children expired because of dysentery (6.25%), heart diseases (6.25%), jaundice (6.25%) and malaria (6.25%).

Table 81: Mortality Status of Adult Household Members in Mawpat Block (N:10) (2021-2023)

Year	Male (18 – 60 years)	Female (18 – 60 years)	Male (60+ years)	Female (60+ years)	Overall Reported Deaths		
					Male (%)	Female (%)	Total (%)
2021	2 (20%)	1 (10%)	2 (20%)	1 (10%)	4 (40%)	2 (20%)	6 (60%)
2022	0	0	1 (10%)	0	1 (10%)	0	1 (10%)
2023	1 (10%)	2 (20%)	0	0	1 (10%)	2 (20%)	3 (30%)
Total	3 (30%)	3 (30%)	3 (30%)	1 (10%)	6 (60%)	4 (40%)	10 (100%)

The above table presents the mortality status of adult household members in the Mawpat block of East Khasi Hills District, Meghalaya, during the period 2021 to 2023. Over this three-yearperiod, a total of 10 adult deaths were reported, comprising 6 males and 4 females. In 2021, the highest number of deaths was recorded, with 6cases in total. These included 4 males—2 from the 18–60 years age group and 2 from the above 60 years age group and 1 female, from 18-60 years and 1 female from above 60 years of age group. In 2022, a total of 1 death was reported, including 1 male from the above 60 years group while no female death was recorded during that year. Meanwhile, in 2023, three deaths were recorded which includes 1 male and 2 female deaths all from the age group of 18 – 60 years.

Table 82: Mortality Status of Adult Household Members in Mawsynram Block (N:13) (2021-2023)

Year	Male (18 – 60 years)	Female (18 – 60 years)	Male (60+ years)	Female (60+ years)	Overall Reported Deaths		
					Male (%)	Female (%)	Total (%)
2021	2 (15.38%)	2 (15.38%)	1 (7.69%)	1 (7.69%)	3 (23.10%)	3 (23.10%)	6 (46.15%)
2022	0	0	1 (7.69%)	0	1 (7.69%)	0 (0.0%)	1(7.69)
2023	1 (7.69%)	1 (7.69%)	1 (7.69%)	3 (23.07%)	2(15.38%)	4 (30.76%)	6(46.15%)
Total	3 (23.10%)	3 (23.10%)	3 (23.10%)	4 (30.76%)	6(46.15%)	7(53.84%)	13 (100%)

The table presents the mortality status of adult household members in the Mawsynramblock of East Khasi Hills District, Meghalaya, over the three-year period from 2021 to 2023. A total of

14adult mortality cases were recorded during this period, comprising 6 males and 7 females. The analysis of the yearly distribution reveals some notable trends. In 2021, there was an equal number of male and female deaths—three males and three females—two males and two femalesbelonging to the 18–60 years age group and one male and one female belonging to 60 years and above age group.In 2022, an exception to the general trend was observed, as only male death was reported dying in 60 years and above age group.In 2023, the pattern resembled that of 2021. A total of 6 deaths were reported, including two males and four females, where one male and one female belong to the age group 19 – 60 years and one male and 3 female belong to the age group 60 years and above.

Table 83: Disease/Cause Specific Adult Mortality Status in Mawpat Block (N:10)

Disease/Cause	2021		2022		2023		Total
	Male	Female	Male	Female	Male	Female	
Diabetes and Blood pressure	0	1 (10%)	0	0	0	0	1 (10%)
Ulcer	1 (10%)	0	0	0	0	0	1 (10%)
Liver failure	2 (20%)	0	0	0	0	0	2 (20%)
Tuberculosis	0	0	0	0	0	1 (10%)	1 (10%)
Jaundice	0	0	0	0	0	1 (10%)	1 (10%)
Stomach cancer	0	0	1 (10%)	0	0	0	1 (10%)
Maternal mortality	0	1 (10%)	0	0	0	0	1 (10%)
Accident	0	0	0	0	1 (10%)	0	1 (10%)
Undiagnosed	1 (10%)	0	0	0	0	0	1 (10%)
Total	4 (40%)	2 (20%)	1 (10%)	0	1 (10%)	2 (10%)	10 (100%)

The table above illustrates the disease- or cause-specific adult mortality status in Mawpat Block. A total of 10 mortality cases were reported between 2021 and 2023. Among these, the highest number of deaths was attributed to liver failure (20%). One case (10%) was recorded with undiagnosed causes. The remaining mortality cases were distributed across various other causes, with only a single death reported under each category in the study. This uneven distribution of mortality causes highlights the critical need for targeted health interventions focused on non-communicable diseases, particularly cancer and cardiovascular conditions.

Among the two liver-related deaths, the case was found to be common among males. This gender disparity may reflect differences in health-seeking behavior, occupational exposure, or lifestyle-related risk factors such as alcohol consumption, which tend to be higher among males in many rural and semi-urban contexts. Interestingly, the year 2021 alone accounted for all the

deaths. In subsequent years, the number of liver-related deaths appeared to decline, with no cases reported in 2022 and 2023. This decline, however, may not necessarily indicate a reduction in liver incidence but could reflect underreporting, migration, or improvements in access to care and early diagnosis. Stomach cancer, diabetes and blood pressure, ulcer, tuberculosis, jaundice, accident and maternal death emerged as one of the leading cause of adult mortality in Mawpat block either one male or one female succumbed to death because of any on the causes as mentioned. Also, the presence of undiagnosed causes of death (10%) signals gaps in diagnostic capacity and the need for strengthened medical certification and reporting systems. Accurate identification of causes of death is essential for formulating effective health policies and allocating resources appropriately.

Table 84: Disease/Cause Specific Adult Mortality Status in Mawsynram Block (N:13)

Disease/Cause	2021		2022		2023		Total
	Male	Female	Male	Female	Male	Female	
Asthma	0	0	0	0	0	0	0
Cancer	1 (7.69%)	0	0	0	1 (7.69%)	1 (7.69%)	3 (23.07%)
Cardiac arrest	0	0	1(7.69%)	0	0	1 (7.69%)	2 (15.38%)
COVID -19	1 (7.69%)	0	0	0	0	0	1 (7.69%)
Diabetes	0	1 (7.69%)	0	0	0	1 (7.69%)	2 (15.38%)
Liver problem	1 (7.69%)	0	0	0	1 (7.69%)	0	2 (15.38%)
Kidney problem	0	1 (7.69%)	0	0	0	0	1 (7.69%)
Ulcer (gastro-intestinal)	0	1 (7.69%)	0	0	0	0	1 (7.69%)
Undiagnosed	0	0	0	0	0	1 (7.69%)	1 (7.69%)
TOTAL	3(23.07%)	3(23.07%)	1(7.69%)	0	2(15.38%)	4 (30.76%)	13 (100%)

The table above presents the disease- or cause-specific adult mortality status of Mawsynram block in the East Khasi Hills District of Meghalaya for the period 2021–2023. A total of 13 adult mortality cases were recorded during this timeframe. Among these, cancer emerged as the leading cause of death, accounting for 23.07% of the total cases (3 out of 14), followed by cardiac arrest, diabetes and liver problem which contributed to 15.38% of deaths (2 cases each). One case (7.69%) remained undiagnosed, indicating possible limitations in diagnostic capabilities or medical certification of cause of death. The remaining mortality cases were attributed to a variety of causes, each contributing one case (7.69% each), and included conditions such as COVID, ulcer and kidney problem highlighting the diverse nature of health challenges in the region.A closer examination of cancer-related deaths reveals that one male death occurred in 2021, while two additional cases were reported in 2023—one male and one female. This distribution suggests a possible resurgence or detection of cancer cases in 2023 after

a gap in the intervening years, which may point toward late-stage diagnosis or an increase in awareness and reporting. The data also reveals that cancer affects both sexes, though slightly more males were impacted in this sample.Cardiac arrest, diabetes and liver problem were identified as the second most common cause of death, with two reported cases each — one male death in 2022 and one female death in 2023 was reported as cardiac arrest, two female deaths one each in 2021 and 2023 was reported as diabetic death and two male deaths one each in 2021 and 2023 was reported because of liver problem which may have raised because of high alcohol consumption. The presence of a single undiagnosed death case is a critical reminder of the need to strengthen healthcare infrastructure, particularly in rural and remote blocks like Mawsynram, where timely access to qualified medical professionals and diagnostic facilities may be limited. Improving mortality surveillance and cause-of-death reporting is essential for accurate public health planning. Moreover, other recorded cases such as COVID – 19, kidney problem and ulcer reveals that only males were affected and died accounting to about 7.69% of the total recorded deaths. This all-male pattern may point to gendered risk factors, including stress, high blood pressure, smoking, alcohol consumption, and limited regular medical check-ups.Gender differences in mortality patterns further call for gender-sensitive health interventions and awareness programs. Simultaneously, the need for robust surveillance and diagnostic infrastructure remains a pressing concern to ensure comprehensive mortality tracking and improved community health outcomes.

Section C: Clinical Signs and Symptoms in the Studied Population in Mawpat and Mawsynram Block of East Khasi Hills

Table 85: Clinical Signs and Symptoms of Mawpat and Mawsynram block of East Khasi Hills District

Categories	Clinical signs and Symptoms	Mawpat	Mawsynram	East Khasi Hills (2 Blocks)
General Appearance	Normal	266 (50.67%)	256 (48.76%)	525 (100%)
	Loss of Subcutaneous fats	1 (0.19%)	0	
	Sunken or Hollow Cheeks	1 (0.19%)	1 (0.19%)	
Nails	Normal	258 (49.14%)	251 (47.81%)	525 (100%)
	Spoon shaped	10 (1.90%)	6 (1.14%)	
Skin	Normal	222 (42.29%)	187 (35.62%)	525 (100%)
	Dry and Scaly	12 (2.29%)	22 (4.19%)	
	Nasolabial seborrhea	0	0	
	Psoriasis from rash	1 (0.19%)	3 (0.57%)	
	Pallor	0	0	

	Follicular hyperkeratosis	0	0	
	Hyperpigmentation	31 (5.90%)	48 (9.14%)	
	Easy bruising	2 (0.38%)	0	
	Dry and scaly +Hyperpigmentation	0	3 (0.57%)	
Eyes	Normal	263 (50.10%)	257 (48.95%)	525 (100%)
	Night blindness	1 (0.19%)	0	
	Photophobia	0	0	
	Bitot spots/Xerosis	4 (0.76%)	0	
Mouth	Normal	263 (50.10%)	257 (48.95%)	525 (100%)
	Glossitis	0	0	
	Cheilosis	0	0	
	Decreased taste or smell	1 (0.19%)	0	
	Loss of tooth enamel	4 (0.76%)	0	
Neck	Normal	268 (51.05%)	257 (48.95%)	525 (100%)
	Goitre	0	0	
	Parotid enlargement	0	0	
Extremities	Normal	225 (42.86%)	201 (38.29%)	525 (100%)
	Ascities	0	0	
	Oedema in legs	1 (0.19%)	2 (0.38%)	
	Bone/Joint pain	15 (2.86%)	28 (5.33%)	
	Muscle pain	15 (2.86%)	19 (3.62%)	
	Muscle wasting	1 (0.19%)	0	
	Bone joint pain+Muscle pain	0	7 (1.33%)	

The table presents the clinical signs and symptoms observed among the studied population from Mawpat and Mawsynram blocks of East Khasi Hills District, Meghalaya, aimed at assessing the current nutritional health status of household members. A total of 525 individuals were examined based on their availability from both blocks.The findings revealed that 50.67% of individuals from Mawpat and 48.76%from Mawsynram appeared normal in general appearance**,** indicating that just under half in Mawpat and just slight less than half in Mawsynram showed no overt clinical signs of nutritional deficiency. This suggests a slightly better general nutritional profile among individuals from Mawpat Block.However, clinical signs of nutritional deficiencie**s**were observed in a small but significant proportion of the population. In terms of subcutaneous fatloss, only 0.19% of individuals in Mawpat exhibited visible signs, also equal percentage of

individuals (0.19%) from both the blocks exhibited sunken or hollow cheeks. Such fat loss or sunken cheeks may be indicative of chronic energy deficiency.In the category of nail abnormalities, only1.90% of individuals from Mawpat block and 1.14% of individuals fro Mawsynram block showed signs of spoon-shaped nails (koilonychia), which is often associated with iron-deficiency anemia. Regardingskin-related symptoms,hyperpigmented skin was more common in Mawsynram**(**9.14%**)** compared to Mawpat**(**5.90%), potentially indicating deficiencies in certain B-complex vitamins or chronic skin stressors. Additionally, dry and scalyskin(2.29%) from Mawpat and (4.19%)from Mawsynram was reported**.** Also,combined hyper-pigmentation with dry and scaly skin (0.57%) were reported exclusively from Mawsynram, further suggesting regional variations in nutrient intake or environmental exposure. Again psoriasis from rash was reported in both the blocks 0.19% from Mawpat and 0.57% from Mawsynram.In the examination of the eyes and mouth, certain clinical signs were noted only in Mawpat: night blindness (0.19%), bitot spot or xerosis (0.76%),decreased taste or smell (0.19%) and loss of tooth enamel (0.76%). These symptoms could be linked to deficiencies in vitamin A, riboflavin, or zinc. No such symptoms were observed in the Mawsynram population, possibly reflecting differences in dietary diversity or access to micronutrient-rich foods.In terms of thyroid enlargement or neck abnormalities**,** no clinical signs were observed in either block, suggesting a low prevalence of iodine deficiency disorders or goitre in the studied sample.When assessing symptoms in the extremities, a noticeable proportion of individuals reported bone and joint pain—2.86%in Mawpat and 5.33% in Mawsynram. Similarly, musclepainwas reported by 2.86%of individuals in Mawpatand3.62%in Mawsynram. Furthermore, a subset of individuals only from Mawsynram block experiencedboth bone/joint and muscle pain contributing to about 1.33% of the studied population. These musculoskeletal symptoms may be associated with deficiencies in vitamin D, calcium, or other micronutrients, as well as occupational strain.

Chapter 5

Anthropometric and Haematological Assessment of Mothers and Children of Mawsynram and Mawpat Blocks of East Khasi Hills:

Part A: Anthropometric and Haematological Assessment of Mothers

Nutritional status of a population is an important tool to study health of any population. We can define nutritional status as "the physical expression of the relationship between the nutrient intake and the physiological requirements of an individual." Nutritional status of a community is the result of the interactions of a wide range of different physical, biological and cultural factors in ecology. It is also one of the indicators of health and well – being of a nation. It mainly depends on the consumption of food in relation to the needs which in turn is influenced by the availability of food and purchasing power (Rao. et al., 2006).

Anthropometry has become a widely used non-invasive and inexpensive practical technique of assessing nutritional status of individual and/or populations especially in clinical and epidemiological studies (WHO, 1995; Mondal, 2014). Anthropometry particularly height and weight are widely accepted simple and reliable means for assessing the nutritional status among mothers than the time consuming bio-chemical test. Studies in this regard reveal that BMI, MUAC, waist and hip circumferences are good indicators of current nutritional status. Protecting women's health during pregnancy, childbirth and the postnatal period is important for maternal health and for this, maternal anthropometry is important in predicting various complications that may occur during pregnancy, such as intrauterine growth retardation and the risk of low birth weight (Casadei. et al., 2022).

The present study was conducted to assess the nutritional status of Mothers (17-49yrs) of Mawpat and Mawsynram Block of East Khasi Hills of Meghalaya. The findings are demonstrated below:

Table 86. Descriptive Statistics (mean±SD, range) of Anthropometric Variables of Mothers of Mawpat and Mawsynram Block of East Khasi Hills

Anthropometric variables	N	Mawpat	N	Mawsynram	N	East Khasi Hills
Height (cm)	135	147.14±5.15(135.1-164.5)	132	147.05±5.29 (125.3-158.8)	267	147.1±5.21 (125.30-164.50)
Weight (kg)	135	50.22±10.08 (30 - 82.8)	132	52.97±9.18 (30-69.7)	267	49.49±9.65 (30-82.80)
Mid-Upper-Arm Circumference	136	23.98±3.14 (16.6- 33.7)	132	23.52±3.03 (17-31.50)	268	23.76±3.09 (16.60-33.70)
Waist Circumference	132	76.11±10.57(56 – 102.7)	132	75.67±9.61 (55.50-96.50)	264	75.90±10.08 (55.50-102.70)
Hip Circumference	132	89.30±9.39 (69 – 120.6)	132	86.89±7.55 (70-106.80)	264	88.1±8.59 (69-120.60)

N.B. Pregnant mothers were excluded

The table presented above summarizes the descriptive statistics of key anthropometric measurements among the studied mothers from the Mawpat and Mawsynram blocks of East Khasi Hills District. The findings reveal slight variations between the two blocks in terms of physical parameters.

The mean height of mothers from the Mawsynram block was recorded at 147.05 ± 5.29 cm, whereas mothers from the Mawpat block exhibited a marginally similaraverage height of 147.14 ± 5.15 cm. This suggests a relatively uniform stature among the mothers across both blocks. With regard to body weight, a more noticeable difference was observed. Mothers from the Mawsynram block had a higher mean weight of 52.97 ± 9.18 kg, compared to 50.22 ± 10.08 kg among their counterparts in the Mawpat block. This variation may indicate differences in nutritional status, dietary intake, or lifestyle factors between the two regions.Moreover, the waist circumference was found to be greater among mothers from Mawpat, with a mean value of 76.11 ± 10.57 cm, in contrast to those from the Mawsynram block. A consistent trend was also noted in the hip circumference, where the average among Mawpat mothers was 89.30 ± 9.39 cm, significantly higher than the 86.89 ± 7.55 cm recorded for mothers from Mawsynram. The mid – upper arm

circumference of the studied mothers from both the block exhibit similar means with a slight higher average from Mawpat block with a value of 23.98±3.14 than Mawsynram block. These findings collectively indicate that mothers from the Mawpat block tend to exhibit higher mean values across several anthropometric indicators, which could reflect better overall nutritional or health status when compared to mothers from the Mawsynram block. Further investigation into socio-economic, dietary, and lifestyle factors may help explain these inter-block differences.

Table 87: Mean Body Mass Index (BMI) of Mothers by Age Group of Mawpat and Mawsynram Block of East Khasi Hills

Age group (years)	Mawpat (N =135)	Mawsynram (N = 132)	East Khasi Hills (N=167)
17-27	22.26±4.03 (17-36.20)	21.84±3.3 (15.80-29)	22.07±3.7 (15.80-36.20)
28-38	23.40±4.18 (14.70-33)	22.43±3.72 (15.90-30.70)	22.88±3.96 (14.70-33)
39-49	23.70±3.50 (15.50-31.50)	23.68±3.67 (14.80-31.10)	22.69±3.54 (14.80-31.50)
Total	23.13±4.03 (14.70-35.20)	22.47±3.63(14.80-31.10)	22.80±3.85 (14.70-36.20)

N.B. Pregnant mothers were excluded

The table presented above illustrates the age group-wise distribution of the mean Body Mass Index (BMI) among the studied mothers from Mawpat and Mawsynram blocks of East Khasi Hills. The overall mean BMI of mothers from the Mawpat block was found to be 23.13 ± 4.03, which is comparatively higher than the mean BMI of 22.47 ± 3.63 recorded for mothers from the Mawsynram block. This indicates a relatively better nutritional status among the mothers in the Mawpat block.When disaggregated by age groups, an interesting trend emerges.

In the 39–49 years age group, mothers from Mawsynram reported the highest mean BMI of 23.68±3.67 suggesting a potential age-related increase in body weight, possibly due to metabolic changes orreduced physical activity associated with advancing age. This could also reflect cumulative effects of lifestyle and diet over time.In contrast, the BMI values among mothers from the Mawpat block showed minimal variation across age groups. Specifically, the 28–38 years and 39–49 years age groups exhibited nearly identical mean BMI values, indicating a more uniform nutritional profile across middle and old-aged women in this block. This uniformity might suggest limited dietary diversity, consistent lifestyle practices, or socio-economic constraints that affect nutritional intake

similarly across these age groups.Overall, the observed differences between the two blocks may be attributed to variations in socio-economic status, access to healthcare and nutrition, education, and other environmental or cultural factors that influence dietary habits and physical well-being.

Table 88: Mean Waist – Hip Ratio (WHR) of Mothers by Age Group of Mawpat and Mawsynram block of East Khasi Hills

Age group (years)	Mawpat(N =132)	Mawsynram (N = 132)	East Khasi Hills (N=164)
17-27	0.84±0.06 (0.72-0.94)	0.87±0.04 (0.79-0.96)	0.86±0.05 (0.72-0.96)
28-38	0.85±0.05 (0.71-1)	0.86±0.06 (0.72-0.98)	0.86±0.06 (0.71-1)
39-49	0.86±0.06 (0.76-1.02)	0.89±0.06 (0.79-0.99)	0.88±0.06 (0.76-1.02)
Total	0.85±0.06 (0.71-1.02)	0.87±0.06 (0.72-0.99)	0.86±0.06 (0.71-1.02)

N.B. Pregnant mothers were excluded

The table above presents the age group-wise means Waist–Hip Ratio (WHR) among the studied mothers from the East Khasi Hills District. The overall mean WHR for the total sample was 0.86 ± 0.06, suggesting that, on average, the mothers fall within the borderline range for metabolic complications.Thedata reveals that the highest mean WHR was observed among mothers in the 39–49 years age group in both Mawpat and Mawsynram blocks, with values of 0.86 ± 0.06 and 0.89 ± 0.06, respectively. This pattern may indicate an age-related increase in abdominal fat accumulation, which is commonly associated with hormonal changes, decreased physical activity and metabolic shifts in later life stages.In contrast, the lowest WHR values were recorded in the 17–27 years age group, with a mean of 0.84 ± 0.06 in the Mawpat block and 0.87 ± 0.04 in the Mawsynram block. These lower values among younger mothers are consistent with the natural tendency for a more balanced fat distribution in early adulthood, often associated with higher physical activity levels and metabolic rates.Hence,thetable highlights a gradual increase in WHR with advancing age, underscoring the importance of age-specific interventions to address risks related to central obesity and associated metabolic disorders. It also reflects subtle inter-block variations that may be influenced by lifestyle, dietary patterns, and overall health awareness.

Table 89: Mean Waist – Height Ratio (WHtR) of Mothers by Age Group of Mawpat and Mawsynram Block of East Khasi Hills

Age group(years)	Mawpat (N=132)	Mawsynram (N=132)	East Khasi Hills (N=164)
17-27	0.51±0.07 (0.38-0.65)	0.51±0.06 (0.41-0.64)	0.51±0.07 (0.38-0.65)
28-38	0.52±0.06 (0.40-0.65)	0.51±0.06 (0.36-0.66)	0.51±0.06 (0.36-0.66)
39-49	0.52±0.07 (0.41-0.66)	0.54±0.06 (0.39-0.64)	0.53±0.07 (0.39-0.66)
Total	0.52±0.07 (0.38-0.66)	0.51±0.06 (0.36-0.66)	0.52±0.06 (0.36-0.66)

N.B. Pregnant mothers were excluded

The table above represents the age group-wise distribution of the mean Waist–Height Ratio (WHtR) among the studied mothers from East Khasi Hills District. The overall mean WHtR for the total sample was 0.52 ± 0.06, indicating that, on average, the mothers fall at slight higher than the threshold commonly used to assess central obesity risk (WHtR ≥ 0.50).The age-wise analysis reveals that mothers in the 17–27 years and 28–38 years age groups from the Mawsynram block exhibited identical mean WHtR values of 0.51 ± 0.06 and 0.51 ± 0.06, respectively. These consistent values suggest a relatively stable waist-to-height proportion among younger and middle-aged mothers in this block, possibly reflecting similar patterns of physical activity, dietary intake, or lifestyle. Also, the highest mean WHtR was observed in the 39–49 years age group from the Mawsynram block, with a value of 0.54 ± 0.06. This elevated ratio in older mothers may reflect age-related increases in central fat deposition, reduced physical mobility, or long-term cumulative effects of lifestyle and metabolic changes. The findings indicate a general trend of increasing WHtR with age, particularly in the Mawsynram block, which could suggest a higher risk of cardio-metabolic complications among older women. However, a similar WHtr with slight difference was observed in Mawpat block under the age group 28 – 38 years and 39 – 49 years with a mean value of 0.52±0.06 and 0.52±0.07 respectively, suggesting a similar pattern of dietary intake and lifestyle among the middle aged and older mothers of Mawpat block.The data also underscores the need for targeted health interventions focusing on age-specific risk assessment and nutritional education to mitigate central obesity.

Table 90: Age Group Wise Distribution of Mothers on the Basis of Body Mass Index (BMI) (WHO, 2004) of Mawpat and Mawsynram Block of East Khasi Hills

Mawpat					Mawsynram				
Age group (in years)	**Underweight (< 18.5)**	**Normal (18.5 – 24.9)**	**Overweight (≤ 25)**	**Total**	**Age group (in years)**	**Underweight (< 18.5)**	**Normal (18.5 – 24.9)**	**Overweight (≤ 25)**	**Total**
17-27	8(5.9%)	22(16.3%)	9(6.7%)	39(28.9%)	**17-27**	6(4.5%)	22(16.7%)	4(3.0%)	32(24.2%)
28-38	11(8.1%)	33(24.4%)	27(20%)	71(52.6%)	**28-38**	13(9.8%)	46(34.8%)	21(15.9%)	81(60.6%)
39-49	1(0.7%)	16(11.9%)	8(5.9%)	25(18.5%)	**39-49**	1(0.8%)	11(8.3%)	8(6.1%)	20(15.2%)
Total	20(14.8%)	71(52.6%)	44(32.6%)	135(100%)	**Total**	20 (15.2%)	79 (59.8%)	33(25%)	132(100%)

N.B. Pregnant mothers were excluded

The table above illustrates the age-wise distribution of the studied mothers based on their Body Mass Index (BMI), categorized into three distinct age groups: 17–27 years, 28–38 years, and 39–49 years. This classification allows for a clearer understanding of nutritional trends and BMI variations across different stages of reproductive life.

In the Mawpat block, 14.8% of the mothers were categorized as underweight; while a comparatively higher proportion (32.6%) were overweight, irrespective of age group. A majority of the mothers (52.6%) fell within the normal BMI range, suggesting an overall moderate nutritional status among the population. The consistently high frequency of mothers with normal BMI across all age groups indicates a relatively balanced nutritional intake and health awareness among the community. However, the age group of 28–38 years showed a notably higher prevalence of overweight mothers (20%) compared to the other age groups. This could be attributed to reduced physical activity, post-pregnancy weight retention, or lifestyle-related factors commonly observed in this middle reproductive age group. Additionally, the same age group showed the highest proportion of underweight mothers (8.1%), which may suggest disparities in nutritional access, workload, or underlying health issues such as anemia or chronic infections.In the Mawsynram block, 59.8% of the mothers were found to have normal BMI, while 15.2% were underweight and 25% were overweight. The higher percentage of normal BMI compared to the Mawpat block may reflect better access to balanced nutrition or health services in this region. Similar to Mawpat, mothers with normal BMI were consistently more frequent across all age groups, reinforcing the idea of a

generally stable nutritional environment. Interestingly, the percentage of underweight mothers remained higher (9.8%) in 28–38 years age groups, possibly because of life style related factors. Furthermore, the overweight category also showed higher prevalence (15.9%) in the 28–38 years age groups. This pattern could be a result of weight gain over the years due to age-related metabolic changes and declining physical activity levels.Overall, the observed patterns suggest that while the majority of mothers maintain a normal BMI, there are pockets of both undernutrition and overnutrition that vary with age and location. These findings highlight the importance of age- and region-specific nutritional interventions to address the double burden of malnutrition**.**

Table 91: Age Group Wise Distribution of Mothers on the Basis of Mid Upper Arm Circumference (Tang et al. 2020) of Mawpat and Mawsynram Block of East Khasi Hills

Mawpat				Mawsynram			
Age group (in years)	**Normal (≥24 cm)**	**Under nutrition (<24 cm)**	**Total**	**Age group (in years)**	**Normal (≥24 cm)**	**Under nutrition (<24 cm)**	**Total**
17 – 27	17(12.5%)	23(16.9%)	40(29.4%)	**17 – 27**	11(8.3%)	21(15.9%)	32(24.2%)
28 – 38	35(25.7%)	36(26.5%)	71 (52.2%)	**28 – 38**	34(25.8%)	46(34.8%)	80(60.6%)
39 – 49	10(7.4%)	15(11%)	25(18.4%)	**39 – 49**	9(6.8%)	11(8.3%)	20(15.2%)
Total	62 (45.6%)	74(54.4%)	136(100%)	**Total**	54(40.9%)	78(59.1%)	132(100%)

N.B. Pregnant mothers were excluded

The table above represents the age-wise distribution of mothers based on their Mid-Upper Arm Circumference (MUAC), which serves as a reliable anthropometric indicator of nutritional status, particularly in resource-constrained settings.

In terms of overall nutritional status, the Mawpat block recorded a higher prevalence of mothers with normal MUAC (45.6%) compared to the Mawsynram block (40.9%). This suggests that mothers in Mawpat may have relatively better access to nutrition, health awareness, or healthcare services. On the other hand, the proportion of undernourished mothers was significantly higher in Mawsynram (59.1%) than in Mawpat (54.4%), indicating potential nutritional deficiencies and socio-economic disparities in the region.When the data is further analyzed by age groups, it was found that in the youngest age group (17–27 years), the prevalence of undernutrition was substantially higher in Mawpat (16.9%) compared to Mawsynram (15.9%). This could be due to more excess to

junk or packaged food among the mothers in Mawpat block. These factors often lead to inadequate maternal nutrition during critical stages of growth and reproduction.Conversely, in the 28–38 years age group, a higher proportion of undernourished mothers was observed in Mawsynram (34.8%) compared to Mawpat (26.5%). Though the difference is significant, it may reflect increased physical workload, nutritional neglect due to caregiving responsibilities, or possible gaps in maternal nutrition services during the peak reproductive years in the Mawsynram region.

In the 39–49 years age group, both blocks reported undernourished mothers with 11% in Mawpat and 8.3% in Mawsynram. Though the difference is marginal yet it may suggest that older mothers across both regions experiences some common or other age-related physiological and metabolic changes that affect nutritional status, regardless of location.Overall, the data highlights regional and age-specific variations in maternal nutritional status. These variations underscore the need for targeted nutritional interventions, especially for the mothers in their peak reproductive years in both Mawpat and Mawsynram. Addressing these issues through community-based programs, nutritional education, and improved access to maternal health services could significantly improve maternal health outcomes in both blocks.

Table 92: Age Group Wise Distribution of Mothers on the Basis of Waist Circumference (WHO, 2011) of Mawpat and Mawsynram Block of East Khasi Hills

Mawpat					Mawsynram				
	Increased(≥80)					Increased(≥80)			
Age group (in years)	Moderately Increased (80.1-87.9 cm)	SubstantiallyIncreased (> 88 cm)	Normal (< 80 cm.)	Total	Age group (in years)	Moderately Increased (80.1-87.9 cm.)	Substantially Increased (> 88 cm.)	Normal (< 80 cm.)	Total
17 – 27	8(6.1%)	6(4.5%)	24(18.2%)	38(28.8%)	**17 – 27**	8(6.1%)	2(1.5%)	22(16.7%)	32(24.2%)
28 – 38	15(11.4%)	10(7.6%)	44(33.3%)	69(52.3%)	**28 – 38**	13(9.8%)	10(7.6%)	57(43.2%)	80(60.6%)
39 – 49	7(5.3%)	3(2.3%)	15(11.4%)	25(18.9%)	**39 – 49**	4(3%)	4(3%)	12(9.1%)	20(15.2%)
Total	30(22.7%)	19(14.4%)	83(62.9%)	132(100%)	**Total**	25(18.9%)	16(12.1%)	91(68.9%)	132(100%)

N.B. Pregnant mothers were excluded

The table above presents the distribution of mothers by age and waist circumference in the studied population of East Khasi Hills. A total of 264 mothers were included in the study—132 from the Mawpat block and 132 from the Mawsynram block. Among them, a significantly higher proportion of mothers from Mawsynram (68.9%) had normalwaist circumference compared to those from Mawpat. In contrast, a considerable percentage of mothers from Mawpat showed increased waist circumference, with 22.7% having moderately increased and 14.4% having substantially increased measurements—both notably higher than those observed in Mawsynram.Age-specific comparisons further highlight this disparity. Among mothers aged 28–38 years, 11.4% of those in the Mawpat block and 9.8% of mothers from Mawsynramexhibited moderately increased waist circumference, whereas, a similar percentage of mothers from both the blocks under the same age group had substantially increased waist circumference. Again similar trend was also noticed among the mothers under the age group 39 – 49 years in Mawsynram block where equal percentages of mothers that are 3% were identified as having moderately and substantially increased waist circumference. While in Mawpat block under the same age group significantly higher percentages of mothers (5.3%) had moderately increased waist circumference. These findings suggest a relatively higher prevalence of abdominal obesity among mothers in Mawpat, particularly in the middle-aged groups, potentially indicating underlying lifestyle or dietary differences between the two blocks.

Table 93: Age Group Wise Distribution of Mothers on the Basis of Waist – Hip Ratio (WHO, 2011) of Mawpat and Mawsynram Block of East Khasi Hills

Mawpat				Mawsynram			
Age group (in years)	**Normal (<0.85 cm)**	**Risk (> 0.86 cm)**	**Total**	**Age group (in years)**	**Normal (<0.85 cm)**	**Risk (> 0.86 cm)**	**Total**
17 – 27	22(16.7%)	16(12.1%)	38(28.8%)	**17 – 27**	11(8.3%)	21(15.9%)	32(24.2%)
28 – 38	40(30.3%)	29(22%)	69(52.3%)	**28 – 38**	35(26.5%)	45(34.1%)	80(60.6%)
39 – 49	11(8.3%)	14(10.6%)	25(18.9%)	**39 – 49**	8(6.1%)	12(9.1%)	20(15.2%)
Total	73(55.3%)	59(44.7%)	132(100%)	**Total**	54(40.9%)	78(59.1%)	132(100%)

N.B. Pregnant mothers were excluded

The above table shows the distribution of mothers by age group and waist – hip ratio. In the present study 59.1% of mothers from Mawsynram block had higher waist hip ratio which denotes the risk of getting metabolic complications. While in case of Mawpat block, higher percentages (55.3%) of mother had fallen under the category of normal category. Also it is apparent from the table that among all the age groups from Mawsynram and Mawpat block under the age groups of 17 – 27 years and 28 – 38 years, a significantly higher number of mothers had higher waist – hip ratio signifying an alarming situation.

Table 94: Age Group Wise Distribution of Mothers on the Basis of Waist – Height Ratio (Hsieh and Muto, 2003) of Mawpat and Mawsynram Block of East Khasi Hills

Mawpat				Mawsynram			
AgeGroup (in years)	**Normal (≥0.5)**	**Risk (<0.5)**	**Total**	**AgeGroup (in years)**	**Normal (≥0.5)**	**Risk (<0.5)**	**Total**
17 – 27	19(14.4%)	19(14.4%)	38(28.8%)	**17-27**	16(12.1%)	16(12.1%)	32(24.2%)
28 – 38	42(31.8%)	27(20.5%)	69(52.3%)	**28-38**	47(35.6%)	33(25%)	80(60.6%)
39 – 49	15(11.4%)	10(7.6%)	25(18.9%)	**39-49**	17(12.9%)	3(2.3%)	20(15.2%)
Total	76(57.6%)	56(42.4%)	132(100%)	**Total**	80(60.6%)	52(39.4%)	132(100%)

N.B. Pregnant mothers were excluded

The above table represents the distribution of mothers based on their waist – height ratio. In the present study 42.4% of mothers from Mawpat block had higher waist – height ratio than Mawsynram block (39.4%) which denotes the risk of getting centrally adiposed. In case of both Mawpat and Mawsynram block it is to be noted that higher numbers of mothers i.e., 27 (20.5%) from Mawpat block and 33 (25%) from Mawsynram block under the age group of 28 – 38 years were more prone to central adiposity signifying a tendency of developing several health problems among them.

Table 95: Age group Wise Distribution of Mothers on the Basis of Random Blood Glucose Category (American Diabetes Association, 2022) of Mawpat and Mawsynram Block of East Khasi Hills

Mawpat					Mawsynram				
Age group	**Normal**	**Pre-Diabetic**	**Diabetes**	**Total**	**Age group**	**Normal**	**Pre-**	**Diabetes(>20**	**Total**

(in years)	(<140 mg./dl)	(140-199 mg./dl)	(>200 mg./dl)		(in years)	(<140 mg./dl)	Diabetic (140-199 mg./dl)	0 mg./dl)	
17 – 27	40(28.2%)	3(2.1%)	0	43(30.3%)	**17 – 27**	39(27.5%)	0(0%)	0(0%)	39(27.5%)
28 – 38	67(47.2%)	4(2.8%)	1(0.7%)	72(50.7%)	**28 – 38**	74(52.1%)	8(5.6%)	1(0.7%)	83(58.5%)
39 – 49	26(18.3%)	1(0.7%)	0	27(19%)	**39 – 49**	19(13.4%)	1(0.7%)	0	20(14.1%)
Total	133(93.7%)	8(5.6%)	1(0.7%)	142(100%)	**Total**	132(93%)	9(6.3%)	1(0.7%)	142(100%)

N.B. Pregnant mothers were excluded

The table above illustrates the age group-wise distribution of mothers based on their random blood glucose (RBG) categories in the Mawpat and Mawsynram blocks of East Khasi Hills. Out of the total 284 mothers studied, 264 (approximately 93.31%) were classified as normal in terms of blood glucose levels, with 93.7% from Mawpat and 93% from Mawsynram. This suggests that the majority of mothers across both blocks fall within the healthy glucose range.

However, a proportion of mothers were identified as pre-diabetic, with a slightly higher prevalence in Mawsynram (6.3%) compared to Mawpat (5.6%). Only a very small number of diabetic cases were reported in both blocks, indicating a relatively low burden of diagnosed diabetes among the studied population.

When analyzed by age groups, a few notable trends emerge. In the 17–27 years age group, Mawpat reported a higher percentage of pre-diabetic cases (2.1%) compared to Mawsynram as no cases was reported from there, suggesting early signs of glycemic risk among young women in that block. Conversely, in the 28–38 years age group, Mawsynram reported a higher proportion of pre-diabetic mothers (5.6%) than Mawpat. Whereas, under the age group 39 – 49 years equal number of mothers (1) were identified as pre – diabetic. The findings suggest a gradual increase in pre-diabetic conditions with advancing age, especially in the Mawsynram block. The differences between the blocks could be attributed to variations in dietary practices, lifestyle patterns, healthcare access, or genetic predispositions. These insights underline the importance of early screening and preventive health interventions, particularly for women in the middle age groups, to mitigate the future risk of type 2 diabetes

Table 96: Age group Wise Distribution of Mothers on the Basis of Blood Pressure Category (WHO, 2015) of Mawpat and Mawsynram Block of East Khasi Hills

Mawpat						Mawsynram					
Age group (in years)	**Normal (SBP <120 And DBP <80)**	**Pre-Hypertension (SBP120-139 And DBP 80-89)**	**Hypertension Stage – I (SBP 140-150 And DBP 90-99)**	**Hypertension Stage – II (SBP ≥ 160 And DBP≥ 100)**	**Total**	**Age group (in years)**	**Normal (SBP <120 And DBP <80)**	**Pre-Hypertension (SBP120-139 And DBP 80-89)**	**Hypertension Stage – I (SBP 140-159 And DBP 90-99)**	**Hypertension Stage – II (SBP ≥ 160 And DBP≥ 100)**	**Total**
17-27	21 (14.1%)	19 (12.8%)	5 (3.4%)	0	45(30.2%)	**17-27**	17 (11.3%)	22 (14.6%)	3 (2%)	1 (0.7%)	43 (28.5%)
28-38	32 (21.5%)	38 (25.5%)	5 (3.4%)	1 (0.7%)	76(51%)	**28-38**	34 (22.5%)	42 (27.8%)	11 (7.3%)	1 (0.7%)	88 (58.3%)
39-49	14 (9.4%)	12 (8.1%)	1 (0.7%)	1 (0.7%)	28(18.8%)	**39-49**	7 (4.6%)	10 (6.6%)	3 (2%)	0	20 (13.2%)
Total	67 (45%)	69 (46.3%)	11 (7.4%)	2 (1.3%)	149(100%)	**Total**	58 (38.4%)	74 (49%)	17 (11.3%)	2 (1.3%)	151 (100%)

N.B. Pregnant mothers were excluded

The table presents the distribution of mothers by age group and blood pressure status across two blocks—Mawpat and Mawsynram. Out of a total of 300 mothers surveyed, 125 (approximately 41.67%) were classified as having normal blood pressure. This suggests that just less than half of the women fall within a healthy blood pressure range, while the remaining is at various stages of elevated blood pressure, which could be a matter of concern from a public health perspective.A significant proportion of mothers were found to be pre-hypertensive, with 49% in Mawsynram and 46.3% in Mawpat. This disparity could be attributed to lifestyle differences between the two blocks. Mawpat, being relatively more urbanised or accessible, might expose women to their health care provider helping them to maintain their rising blood pressure. Interestingly, when analyzed by age groups, a reversal of this trend is noticed in

the youngest group (17–27 years), where Mawsynram had a higher proportion of pre-hypertensive mothers (14.6%) compared to Mawpat (12.8%). This could indicate early onset of blood pressure irregularities in Mawsynram, potentially due to nutritional deficiencies, early childbearing, or limited awareness and access to preventive health measures in more rural settings. In contrast, the older age groups 28–38 years in Mwasynram block and 39–49 years in Mawpat block showed a higher pre-hypertensive burden with 27.8% in Mawsynram and 25.5% in Mawpat and with 8.1% in Mawpat and 6.6% in Mawsynram pointing towards cumulative lifestyle-related risks over time in semi-urban or peri-urban populations.In the case of Hypertension Stage I, Mawsynram reported a higher overall prevalence (11.3%) compared to Mawpat (7.4%). This difference again reinforces the possibility that environmental and behavioral risk factors are more pronounced in the former. The only age group where Mawpat showed a slightly higher proportion was 17–27 years and 28 – 38 years (3.4%) possibly reflecting early and mid life stressors or unrecognized maternal health issues that are manifesting earlier in life. However, for the age group 28–38 years, Mawsynram showed significantly higher prevalence of Stage I hypertension—7.3%. These findings might suggest an age-related progression of blood pressure conditions that become more pronounced with time in populations exposed to higher metabolic and cardiovascular risk factors.Hypertension Stage II cases were relatively rare in both areas, reported in 1.3% of mothers from both Mawpat and Mawsynram block. Though the numbers are small, their presence cannot be ignored. These cases could be reflective of long-standing unmanaged hypertension or other co-morbid conditions, which, if unaddressed, could lead to serious maternal and cardiovascular complications.The data suggests that while Mawsynram might be experiencing early signs of blood pressure irregularities among its younger mothers, Mawpat shows a clearer trend of increasing blood pressure with advancing age, particularly in pre-hypertension category. This may be due to lifestyle transitions, dietary shifts, and changing health behaviors over time.From a public health standpoint, the findings emphasize the need for age-specific and area-specific interventions. Health education, early screening, dietary counseling, and lifestyle modifications could play a key role in preventing the progression of hypertension among mothers, especially in vulnerable age groups.

Table 97: Age Group Wise Haemoglobin category of Non – Pregnant Women (WHO, 1968) of Mawpat and Mawsynram Block of East Khasi Hills

Mawpat						Mawsynram					
Age Group (in years)	Normal (12 Or Higher)	Mild Anemic (11.0-11.9)	Moderate Anemic (8.0-10.9)	Severe Anemic (Lower Than 8.0)	Total	Age Group (in years)	Normal (12 Or Higher)	Mild Anemic (11.0-11.9)	Moderate Anemic (8.0-10.9)	Severe Anemic (Lower Than	Total

										8.0)	
17-27	13 (15.1%)	6 (7%)	5 (5.8%)	0	24 (27.9%)	**17-27**	13 (12.5%)	2 (1.9%)	13 (12.5%)	1 (1%)	29 (27.9%)
28-38	22 (25.6%)	6 (7%)	13 (15.1%)	1 (1.2%)	42 (48.8%)	**28-38**	31 (29.8%)	8 (7.7%)	18 (17.3%)	4 (3.8%)	61 (58.7%)
39-49	11 (12.8%)	5 (5.8%)	3 (3.5%)	1 (1.2%)	20 (23.3%)	**39-49**	11 (10.6%)	1 (1%)	2 (1.9%)	0	14 (13.5%)
Total	46 (53.5%)	17 (19.8%)	21 (24.4%)	2 (2.3%)	86 (100%)	**Total**	55 (52.9%)	11 (10.6%)	33 (31.75%)	5 (4.8%)	104 (100%)

N.B. Pregnant mothers were excluded. Mothers were also excluded as they did not allowed for heamoglobin test

The above table illustrates the age group – wise distribution of non – pregnant mothers based on their haemoglobin level categories in the Mawpat and Mawsynram blocks of East Khasi Hills. Out of the total 190 studied mothers, 101 (approximately 53.16%) were classified as normal in terms of haemoglobin level, with 53.5% from Mawpat block and 52.9% from Mawsynram block. This suggests that the majority of mothers across both blocks fall within healthy haemoglobin range. However, in both the block prevalence of moderate anaemia can be noticed indicating that mothers are anaemic with 31.75% from Mawsynram block and 24.4% from Mawpat block creating a burden in the population.When analyzed by age groups, it was noticed that in 17 – 27 years age group, Mawpat block reported a higher percentage of mild anaemic cases (7%) compared to 1.9% in Mawsynram signifying a risk of low haemoglobin level among them. Conversely, in the 28 – 28 years age group, Mawsynram reported a higher proportion of moderately anaemic mothers (17.3%) than Mawpat. While, under the age group 39 – 49 years age group, Mawpat recorded a greater number of moderately anaemic cases compared to Mawsynram.Again, greater percentages of severely anaemic cases were reported from Mawsynram block (4.8%) compared to Mawpat block. Whereas, a more or less equal percentages of mothers from Mawpat (1.2%) under the age groups 28 – 38 years and 39 – 49 years and Mawsynram (1%) under the age group 17 – 27 years were severely anaemic. Interestingly, in 28 – 38 years age group more mothers i.e., 3.8% from Mawsynram block were severely anaemic than the mothers in the Mawpat block (1.2%).As there is increased numbers of mothers experiencing anaemia in the age group 28 – 38 years, suggesting that the middle aged mothers are more prone to anaemia which may be because of multiple pregnancies, low birth spacing and dietary practices.

Part B: Anthropometric and Haematological Assessment of Children

The well-being of a child lays the foundation for a healthy and productive future, not just for the individual but for society as a whole. Prioritizing child health ensures optimal physical, cognitive, and emotional development, enabling children to reach their full potential (UNISEF 2008). Neglecting their health, on the other hand, can lead to long-term consequences, hindering their growth, learning abilities, and overall quality of life.

A cornerstone of child health is their nutritional status. Adequate nutrition during childhood is crucial for proper growth, development of the immune system, and cognitive function. Malnutrition, in all its forms – undernutrition, overnutrition, and micronutrient deficiencies – can have detrimental effects (NCDHHS 2025). Undernutrition weakens the immune system, making children more susceptible to infections and increasing morbidity and mortality. It also impairs physical growth and cognitive development, leading to lower educational attainment and reduced productivity in later life. Conversely, overnutrition leads to childhood obesity, which is associated with an increased risk of chronic diseases like diabetes, cardiovascular disease, and certain cancers later in life. Micronutrient deficiencies, often referred to as "hidden hunger," can have profound impacts on development, affecting brain function, vision, and immune responses (CDC 2024).

Assessing the nutritional status of a child is a vital step in ensuring their healthy development. A comprehensive assessment involves a combination of methods, including clinical examination, dietary assessment, biochemical tests, and anthropometry. Anthropometry plays a crucial role in the assessment of a child's nutritional status. It involves the systematic measurement of the human body and its parts. These measurements are then compared to reference data for children of the same age and sex to evaluate their growth patterns and body composition. Researchers from all over the globe, commonly used four anthropometric indicators to access the nutritional status of the children: stunting (low height for age), wasting (low weight for height), underweight (low weight for age) following WHO criteria (below -2 standard deviation) (WHO 1995) and thinness (age and sexspecific BMI) (Cole et al. 2007, Rao et al. 2021).

The present study was conducted to assess the nutritional status of Khasi Children of Mawpat and Mawsynram blocks of East Khasi Hills District of Meghalaya. The findings are demonstrated below:

Table 98: Descriptive Statistics of Anthropometric Variables of Children of Mawsynram and Mawpat Block of East Khasi Hills (0-59 Months)

Height							
Mawpat				Mawsynram			
Age Group	**Number**	**Mean**	**Standard Deviation**	**Age Group**	**Number**	**Mean**	**Standard Deviation**
0-11	28	67.61	±9.53	**0-11**	31	67.10	±6.43
12-23	21	73.54	±5.93	**12-23**	27	74.00	±7.10
24-35	16	82.33	±4.69	**24-35**	21	80.48	±7.53
36-47	17	90.41	±5.83	**36-47**	23	87.59	±5.16
48-59	23	95.34	±8.09	**48-59**	26	95.60	±4.96
Total	105	80.80	±13.13	**Total**	128	80.22	±12.13
Weight							
Mawpat				Mawsynram			
Age Group	**Number**	**Mean**	**Standard Deviation**	**Age Group**	**Number**	**Mean**	**Standard Deviation**
0-11	27	7.81	±1.86	**0-11**	31	7.84	±2.41
12-23	22	9.27	±1.6	**12-23**	28	9.18	±1.25
24-35	16	11.16	±1.27	**24-35**	21	11.01	±1.69
36-47	17	13.06	±1.8	**36-47**	23	12.53	±1.93
48-59	23	14.47	±2.97	**48-59**	26	14.50	±2.25
Total	105	10.93	±3.26	**Total**	129	10.83	±3.13
Mid Upper Arm Circumference							
Mawpat				Mawsynram			
Age Group	**Number**	**Mean**	**Standard**	**Age Group**	**Number**	**Mean**	**Standard**

			Deviation				Deviation
0-11	26	14.06	±1.51	**0-11**	31	13.19	±1.48
12-23	21	14.83	±1.82	**12-23**	26	14.00	±1.88
24-35	16	15.07	±1.67	**24-35**	21	13.66	±1.52
36-47	17	15.4	±1.99	**36-47**	23	14.76	±1.66
48-59	23	15.6	±1.7	**48-59**	26	15.14	±1.06
Total	103	14.94	±1.79	**Total**	127	14.12	±1.68
Head Circumference							
Mawpat				**Mawsynram**			
Age Group	**Number**	**Mean**	**Standard Deviation**	**Age Group**	**Number**	**Mean**	**Standard Deviation**
0-11	27	41.97	±2.68	**0-11**	31	42.56	±2.83
12-23	20	44.46	±2.22	**12-23**	27	44.94	±2.12
24-35	16	45.77	±2.21	**24-35**	21	45.63	±2.23
36-47	17	47.52	±2.07	**36-47**	23	46.53	±1.63
48-59	23	47.43	±2.02	**48-59**	26	48.73	±1.68
Total	103	45.18	±3.15	**Total**	128	45.30	±4.17
Chest Circumference							
Mawpat				**Mawsynram**			
Age Group	**Number**	**Mean**	**Standard Deviation**	**Age Group**	**Number**	**Mean**	**Standard Deviation**
0-11	25	45.33	±3.81	**0-11**	31	43.66	±3.88
12-23	20	48.51	±2.87	**12-23**	26	46.32	±2.57
24-35	16	49.36	±3.34	**24-35**	21	48.64	±2.35
36-47	17	50.88	±2.37	**36-47**	23	49.17	±2.34
48-59	23	51.93	±3.55	**48-59**	26	50.99	±2.35
Total	101	49.03	±4.05	**Total**	127	47.52	±3.87

The above table presents a detail description of descriptive statistics of some anthropometric measurements taken among the studied children from Mawpat and Mawsynram block of East Khasi Hills District. The table revealed that the mean height of children from Mawsynram block was recorded as 80.22±12.13cm, whereas, children from Mawpat block showed a slight increase in their mean height with 80.80±13.13cm. This suggests that Mawpat children are slightly taller than Mawsynram children. Moreover, the age group wise mean height has demonstrated a significant increase with age in both the blocks. Interestingly, in the age group of 24 – 35 months, children of Mawpat block showed higher mean height of 82.33±4.69 cm than Mawsynram block showing mean height of 80.48±7.53 cm. Again, in the age group of 48 – 59 months, children of Mawsynram block had a higher mean height of 95.60±4.96 cm than the children of Mawpat block (95.34±8.09 cm).

With regard to body weight, a slight increase was noticed among the children of Mawpatblock with a mean value of 10.93±3.26 kg than the children of Mawsynram block with a mean weight of 10.83±3.13 kg. In the age group of 36 – 47 months, Mawpat children had a higher mean weight of 13.06±1.8 kg than the children of Mawsynram block with a mean weight of 12.53±1.93 kg. It is also evident from the table that as the age of children increases mean weight also increases.

Similarly, the mid – upper arm circumference was found to be greater among the children from Mawpat block, with a mean value of 14.94±1.79 cm, in comparison to those from Mawsynram block, where the maximum difference was noticed among the children of age group 24 – 35 months. Conversely, the head circumference showed that Mawsynram children had a slight higher mean value of 45.30±4.17 cm than the children of Mawpat block (45.18±3.15 cm). Moreover, in the age group of 48 – 59 months, the children of Mawsynram block had a higher mean value of 48.73±1.68 cm than the children of Mawpat block. A consistent trend was also noticed in chest circumference, where the average among Mawpat children was 49.03±4.05 cm, significantly higher than 47.52±3.87 cm recorded for children from Mawsynram block.

Table 99: Age Group Wise Distribution of Children of Mawpat Block According to Stunting (WHO, 2006)

Mawpat							
Age group (in months)	**Normal (-2SD to +2SD)**		**Moderate Stunting (-3SD & +3SD)**		**Severe Stunting (Above -3SD & +3SD)**		**Total**
	Boys	**Girls**	**Boys**	**Girls**	**Boys**	**Girls**	
0-11	11(10.5%)	16(15.3%)	0	0	0	0	27(25.96%)
12-23	9(8.65%)	13(12.5%)	0	0	0	0	22(21.15%)
24-35	7(6.73%)	9(8.65%)	0	0	0	0	16(15.38%)
36-47	9(8.65%)	8(7.69%)	0	0	0	0	17(16.34%)
48-59	13(12.5%)	7(6.73%)	1(0.96%)	1(0.96%)	0	0	22(21.15%)
Total	49(47.1%)	53(50.96%)	1(0.96%)	1(0.96%)	0	0	104(100%)

The above table illustrates the age – wise distribution of studied children of Mawpat block based on their height – for – age or stunting, categorized into five distinct age groups: 0 – 11 months, 12 – 23 months, 24 – 35 months, 36 – 47 months and 48 – 59 months respectively. A total of 104 children were studied and it was found that more girls that are 50.96% falls under normal category than boys which accounts for 47.1% of the total studied children. Interestingly, equal percentage of boys and girls i.e., 0.96% were found to be moderately stunted which was recorded only from the age group of 48 – 59 months, whereas no boys and girls from Mawpat block were found to be severely stunted. Finally, it can be said that girls overall performed better than boys in normal height-for-age status.

Table 100: Age Group Wise Distribution of Children of Mawsynram Block According to Stunting (WHO, 2006)

Mawsynram							
Age group (in months)	**Normal (-2SD to +2SD)**		**Moderate Stunting (-3SD to +3SD)**		**Severe Stunting (Above -3SD & +3SD)**		**Total**
	Boys	**Girls**	**Boys**	**Girls**	**Boys**	**Girls**	
0-11	12 (38.70%)	15(48.38%)	2(6.45 %)	0	1(3.22%)	1(3.22%)	31(24.22%)
12-23	9(33.33%)	6(22.2%)	2(7.40%)	3(11.11%)	4(14.81%)	3(11.11%)	27(21.09%)
24-35	5(23.81%)	3(14.29%)	1(4.76%)	4(19.05%)	6(28.57%)	2(9.52%)	21(16.41%)
36-47	6(26.09%)	8(34.78%)	1(4.35%)	3(13.04%)	2(8.70%)	3(13.04%)	23(17.97%)
48-59	10(38.46%)	8(30.77%)	4(15.38%)	2(7.69%)	1(3.85%)	1(3.85%)	26(20.31%)
Total	42(32.81%)	40(31.25%)	10(7.81%)	12(9.37%)	14(10.94%)	10(7.81%)	128(100%)

The above table demonstrated the age – wise distribution of studied children of Mawsynram Block based on their height – for – age or stunting, categorized into five distinct age groups: 0 – 11 months, 12 – 23 months, 24 – 35 months, 36 – 47 months and 48 – 59 months. A total of 128 children were studied and it was found that more boys that are 32.81% falls under normal category than girls which accounts for 31.25% of the total studied children. Here, 7.81% of boys and 9.37% of girls were found to be moderately stunted where the number of girls is higher than the boys of the total studied population of children. Interestingly, in case of severely stunted 10.94% of boys and 7.81% of girls falls under this category where the percentage is significantly higher for boys than girls. Moreover, it is to note that in the age group of 24 – 35 months more boys that is 28.57% were severely stunted than girls that is 9.52% but in the age group of 36 – 47 months more girls that is 13.04% were severely stunted than boys that is 8.70% who were reported as severely stunted with regard to the total studied children in that age group. Again, in the age group of 12 – 23 months, higher percentages of

boys (14.81%) were found to be severely stunted than girls (11.11%). But in the age groups of 0 – 11 months equal percentages of boys and girls (3.22%) . This similar trend was also noticed among the boys and girls of the age group 48 – 59 months.

In both blocks of East Khasi Hills, when combined together a greater percentage of girls fall under the normal category compared to boys, suggesting better overall height-for-age growth among girls. However, when looking at stunting severity, the pattern varies. In the Mawpat block (104 children), no boys and girls were reported as severely stunted, whereas in the Mawsynram Block (128 children), a significantly higher percentage of boys were severely stunted than girls. Additionally, as there is less recorded children from Mawpat block in stunted category than Mawsynram block it may accounts for better nutritional or socio – economic factors.

Table 101: Age Group Wise Distribution of Children of Mawpat Block According to Underweight (WHO, 2006)

Mawpat							
Age group (in months)	**Normal (-2SD to +2SD)**		**Moderate Underweight (-3SD & +3SD)**		**Severe Underweight (Above -3SD & +3SD)**		**Total**
	Boys	**Girls**	**Boys**	**Girls**	**Boys**	**Girls**	
0-11	10 (9.62%)	16(15.38%)	0	0	1(0.9%)	0	27(25.96%)
12-23	9(8.65%)	13(12.5%)	0	0	0	0	22(21.15%)
24-35	7(6.73%)	9(8.65%)	0	0	0	0	16(15.38%)
36-47	9(8.65%)	8(7.69%)	0	0	0	0	17(16.34%)
48-59	12(11.5%)	7(6.73%)	1(0.96%)	1(0.96%)	1(0.96%)	0	22(21.15%)

Total	47(45.1%)	53(50.96%)	1(0.96%)	1(0.96%)	2(1.92%)	0	104(100%)

The above table shows the age – wise distribution of children of Mawpat block of East Khasi Hills District based on weight – for – age or underweight. From the table it can be understood that more girls irrespective of age groups were found to be normal (50.96%) than the boys (45.1%). Whereas, equal percentages of both boys and girls were found to be moderately underweight (0.96%) and 0.96% of boys were reported as severely underweight while no girls were reported in that category. The moderately underweight boys and girls were recorded in the age group of 48 – 59 months and the severely underweight boy was reported under the age group 0 – 11 months.

Table 102: Age Group Wise Distribution of Children of Mawsynram Block According to Underweight (WHO, 2006)

Mawsynram							
Age group (in months)	**Normal (-2SD to +2SD)**		**Moderate Underweight (-3SD to +3SD)**		**Severe Underweight (Above -3SD & +3SD)**		**Total**
	Boys	**Girls**	**Boys**	**Girls**	**Boys**	**Girls**	
0-11	12(38.71%)	13(41.93%)	1(3.22%)	2(6.45%)	2(6.45%)	1(3.22%)	31(24.03%)
12-23	15(53.57%)	10(35.71%)	1(3.57%)	1(3.57%)	0	1(3.57%)	28 (21.70%)
24-35	9(42.86%)	8(38.09%)	3(14.28%)	1(4.76%)	0	0	21(16.28%)
36-47	9(39.13%)	12(52.17%)	0	1(4.35%)	0	1(4.35%)	23(17.83%)
48-59	12(46.15%)	10(38.46%)	2(7.69%)	1(3.85%)	1 (3.85%)	0	26 (20.15%)

Total	57 (44.19%)	53(41.08%)	7(5.43%)	6(4.65%)	3 (2.32%)	3(2.32%)	129(100%)

The above table shows the age – wise distribution of children of Mawsynram Block of East Khasi Hills District of Meghalaya based on weight – for – age or underweight. From the table it can be understood that more boys irrespective of age groups were found to be normal (44.19%) than the boys (41.08%). Also, higher percentage of boys (5.43%) were moderately underweight than girls (4.65%), whereas, similar percentage of both boys and girls were reported as severely underweight (2.32%). In the age group of 12 – 23 months equal percentages of boys and girls were reported as moderately stunted (3.57%) while only 1 boy (3.57%) was found to be severely stunted in that age group. Interestingly, across all the age groups girls were found to be severely stunted

A comparison between the children of Mawpat Block and Mawsynram Block of East Khasi Hills District based on weight-for-age (underweight status) highlights some notable trends. When both blocks, were studied together it was found that a higher percentage of girls were found to be normal compared to boys (approximately, 45.49%), suggesting better weight status among girls across age groups. However, in terms of moderate and severe underweight, higher percentages of both boys and girls were reported from Mawsynram block across all age groups, suggesting limited access to better diet and health care being a farthest block.

Table 103: Age Group Wise Distribution of Children of Mawpat Block According to Wasting (WHO, 2006)

Mawpat							
Age group (in months)	**Normal (-2SD to +2SD)**		**Moderate Wasting (-3SD & +3SD)**		**Severe Wasting (Above -3SD & +3SD)**		**Total**
	Boys	**Girls**	**Boys**	**Girls**	**Boys**	**Girls**	
0-11	8(7.69%)	12(11.54%)	2(1.92%)	2(1.92%)	1(0.96%)	2(1.92%)	27(25.96%)
12-23	7(6.73%)	9(8.65%)	2(1.92%)	2(1.92%)	0	2(1.92%)	22(21.15%)

24-35	7(6.73%)	9(8.65%)	0	0	0	0	16(15.38%)
36-47	8(7.69%)	6(5.77%)	1(0.96%)	1(0.96%)	0	1(0.96%)	17(16.34%)
48-59	13(12.5%)	8(7.69%)	0	0	1(0.96%)	0	22(21.15%)
Total	43(41.35%)	44(42.31%)	5(4.81%)	5(4.81%)	2(1.92%)	5(4.81%)	104(100%)

The above table revealed the age – wise distribution of children of Mawpat block based on height-for-weight or wasting, which shows that regardless of all age groups more girls (42.31%) were found to be normal than boys (41.35%). Whereas, 5 boys and girls (4.81%) girls were reported as moderately wasted and 2 (1.92%) boys and 5 (4.81%) girls were reported as severely wasted.Under the age groups 0 – 11 months and 12 – 23 months equal number of boys and girls (2, 1.92%) were reported as moderately wasted. While with regard to the age group 0 – 11 months more girls (1.92%) were found to be severely wasted than boys (0.96%), whereas no boys were recorded to be severely wasted in the age group 12 – 23 months and 36 – 47 months respectively with regard to girls. Again in the age group of 36 – 47 months equal percentage of both boys and girls (0.96%) were reported as moderately wasted and only 1 (0.96%) girl was reported as severely wasted under the same age group.

Table 104: Age Group Wise Distribution of Children of Mawsynram Block According to Wasting (WHO, 2006)

Mawsynram							
Age group (in months)	**Normal (-2SD to +2SD)**		**Moderate Wasting (-3SD & +3SD)**		**Severe Wasting (Above -3SD & +3SD)**		**Total**
	Boys	**Girls**	**Boys**	**Girls**	**Boys**	**Girls**	
0-11	11(35.48%)	12 (38.71%)	1(3.23%)	0	3(9.68%)	4(12.90%)	31(24.22%)
12-23	13(48.15%)	12(44.44%)	0	0	2(7.41%)	0	27(21.09%)
24-35	9(42.86%)	9(42.86%)	2(9.52%)	0	1(4.76%)	0	21(16.41%)

36-47	7(30.43%)	13(56.52%)	0	0	2(8.70%)	1(4.35%)	23(17.97%)
48-59	15(57.69%)	11(42.31%)	0	0	0	0	26(20.31%)
Total	55(42.97%)	57(44.53%)	3(2.34%)	0	8(6.25%)	5(3.91%)	128(100%)

The above table revealed the age – wise distribution of children of Mawsynram block based on height-for-weight or wasting,which shows that regardless of all age groups more girls (44.53%) were found to be normal than boys (42.97%). Whereas, only 3 (2.34%) boys and no girls were found as moderately wasted and 8 (6.25%) boys and 5 (3.91%) girls were found as severely wasted. In the age group 0 – 11 months only 1 (3.23%) and under the age group 24 – 35 months only 2 (9.52%) boys were reported as moderately wasted while no girls were reported in that category across all age groups. With regard to severe wasting, in the age group 0 – 11 months, more girls that are 12.90% were found to be severely wasted than boys who accounts for about 9.68% of the total studied children. Again, in the age groups 12 – 23 months and 36 – 47 months 7.41% and 8.70% boys respectively were found to be severely wasted, while no girls were found to be severely wasted in 12 – 23 months age group and only 1 (4.35%) girl was reported as severely wasted in 36 – 47 months age group.

The comparison between the children of Mawpat Block and Mawsynram Block, based on height-for-weight (wasting status), reveals several important patterns. In both block, a higher percentage of girls were found to be normal compared to boys — 42.31% in Mawpat and 44.53% in Mawsynram — suggesting better overall acute nutritional status among girls. However, when examining wasting categories, some differences emerge.

In Mawsynram block, 6.25% of boys and 3.91% of girls were severely wasted, while only 1 boy (3.23%) from 0 – 11 months age group and 2 boys (9.52%) from 24 – 35 months age group were reported as severely wasted and no girls were severely wasted in any age group. In contrast, in Mawpat Block, both moderate and severe wasting wasmore pronounced among boys: 4.81% boys and 4.81% girls were moderately wasted, while 1.92% boys and 4.81% girls were severely wasted. Age-specific patterns show that in Mawsynram, severe wasting among girls was slightly higher in the early months (0–11 months), whereas boys showed slightly higher severe wasting percentages in later age groups (24–47 months). In Mawpat, girls consistently showed wasting across multiple age groups, including both moderate and severe forms, particularly in the 0–11 months, 12–23 months, and 36–47 months age brackets,

with boys showing no cases of severe wasting except in 0 - 11 months and 48 – 59 months. Notably, the burden of severe wasting was substantially higher among boys in Mawsynram Block compared to Mawpat Block, indicating a more severe nutritional vulnerability for boys in that region. Overall, girls consistently exhibited better nutritional outcomes across both blocks, but boys, particularly in Mawsynram Block, were found to be at a greater risk for both moderate and severe wasting across several age groups.

Table 105: Age Group Wise Distribution of Children of Mawpat Block According to Mid Upper Arm Circumference (WHO, 2009)

Mawpat							
Age group (in months)	**Normal (above 12.5 cm)**		**Moderate (11.5 to 12.5 cm)**		**Severe Acute Malnutrition (less than 11.5 cm)**		**Total**
	Boys	**Girls**	**Boys**	**Girls**	**Boys**	**Girls**	
0-11	9(8.91%)	13(12.87%)	1(0.99%)	0	0	2(1.98%)	25(24.75%)
12-23	8(7.92%)	11 (10.89%)	0	1(0.99%)	1(0.99%)	0	21(20.79%)
24-35	7(6.93%)	9(8.91%)	0	0	0	0	16(15.84%)
36-47	9(8.91%)	8(7.92%)	0	0	0	0	17(16.83%)
48-59	13(12.87%)	8(7.92%)	1(0.99%)	0	0	0	22(21.78%)

Total	46(45.54%)	49(48.51%)	2(1.98%)	1(0.99%)	1(0.99%)	2(1.98%)	101(100%)

The above table illustrates the age – wise distribution of studied children of Mawpat block based on Mid Upper Arm Circumference. For this analysis 101 children were considered. Out of 101 studied children, only 95 children (including 46 boys and 49 girls) were reported as normal, where as 6 children (including 3 boys and 3 girls) were reported as malnourished with varying degree. In case of moderate malnourishment 0.99% of boys under the age groups 0 – 11 months and 48 – 59 months were reported as moderately malnourished while 0.99% girls under the age group 12 – 23 months were found to be moderately malnourished. Moreover, 1.98% of girls from 0 – 11 months and 0.99% girls from 12 – 23 months were identified as severely acute malnourished. Both moderate and severe acute malnourishment showed similar prevalence among girls than boys.

Table 106: Age Group Wise Distribution of Children of Mawsynram Block According to Mid Upper Arm Circumference (WHO, 2009)

Mawsynram							
Age group (in months)	**Normal (above12.5cm)**		**Moderate (11.5to 12.5cm)**		**Severe Acute Malnutrition (less than11.5 cm)**		**Total**
	Boys	**Girls**	**Boys**	**Girls**	**Boys**	**Girls**	
0-11	10(32.26%)	10(32.26%)	4(12.90%)	4(12.90%)	1(3.23%)	2(6.45%)	31(24.41%)
12-23	12(46.15%)	7(26.92%)	3(11.54%)	4(15.38%)	0	0	26(20.47%)
24-35	8 (38.09%)	8(38.09%)	4(19.05%)	0	0	1(4.76%)	21(16.53%)
36-47	8(34.78%)	13(56.52%)	0	1(4.35%)	1(4.35%)	0	23(18.11%)
48-59	15(57.69%)	11(42.31%)	0	0	0	0	26(20.47%)
Total	53(41.73%)	49(38.58%)	11(8.66%)	9(7.09%)	2(1.57%)	3(2.36%)	127(100%)

The table represented the age – wisedistribution of studied children of Mawsynram block of East Khasi hills district of Meghalaya on the basis of Mid Upper Arm Circumference. For this analysis 127 children were considered. Out of 127 studied children, maximum

number of boys (53, 41.73%) was found to be normal than girls (49, 38.58%) and 25 children (including 13 boys and 12 girls) were reported as malnourished with varying degrees. In the age group of 0 – 11 months, out of 31studied children, 6 (19.35%) girls were categorized as malnourished whereas, 5 (16.13%) boys were categorized as malnourished representing a higher prevalence of malnourishment among girls than boys. Also in the age group of 12 – 23 months higher percentage of girls (15.38%) than boys (11.54%) were reported as moderately malnourished while no boys and girls were reported as severely acute malnourished in that age group.

Again in the age group of 24 – 35 months only 4 (19.05%) boys and 1 girl (4.76%) were reported as moderately and severely acute malnourished respectively. Meanwhile, in the age group of 36 – 47 months equal percentage of both boys and girls that is 4.35% was categorized as moderately and severely acute malnourished.

The Mid-Upper Arm Circumference (MUAC) analysis of children from Mawpat and Mawsynram blocks reveals some notable trends in nutritional status. In both blocks, the majority of children were categorized as normal, but a slightly higher proportion of normal children was found in Mawsynram (49 girls and 53 boys) compared to Mawpat (49 girls and 46 boys).

Regarding malnutrition, equal percentage of boys and girls from Mawpat block and greater percentage of boys from Mawsynram block were found to be affected where the prevalence was more pronounced in Mawsynram Block, where 25 children (13 boys and 12 girls) were reported as malnourished compared to 6 children (3 boys and 3 girls) in Mawpat Block. In Mawpat, uniform percentage of moderate and severe acute malnutrition was noted among both boys and girls while in Mawsynram it was observed that more boys were moderately malnourished and more girls were severely acute malnourished.

Age-specific patterns show that in both blocks, the 0–11 months age group had the highest burden of severe acute malnutrition, particularly among girls. In Mawpat, 1.98% of girls were severely wasted and compared to this no boys were reported in that category; similarly, in Mawsynram, 6.45% of girls and 3.23% of boys were identified as malnourished in the same age group. In the 12–23 months group, both blocks reported moderate malnutrition, but Mawsynram showed a significantly higher presence of severe cases among girls (15.38%) than Mawpat (no severe cases among girls reported for that age group). In the 24–35 months group, moderate malnutrition was not present in Mawpat but recorded at 19.05% among boys from Mawsynram, while in the 36–47 months and 48–59 months groups, though malnourishment was recorded among the studied children of either block but in very less frequency. Overall, while malnutrition remains a concern in both regions, the burden appears slightly higher in Ri-Muliang Block, with a consistent pattern of greater vulnerability among girls across most age groups.

Table 107: Distribution of Studied Children of Mawpat Block Based on Haemoglobin Level (WHO, 1968)

Mawpat					
Age group (in months)	**Non Anaemia (11 g/dL or High)**	**Anaemia**			**Total**
		Mild (10.0-10.9 g/dL)	**Moderate (7.0-9.9 g/dL)**	**Severe (lower than 7 g/dL)**	
6-11	0	0	1 (2.44%)	1 (2.44%)	2 (4.88%)
12-23	0	0	5 (12.20%)	0	5 (12.20%)
24-35	7 (17.07%)	1 (2.44%)	2 (4.88%)	1 (2.44%)	11 (26.83%)
36-47	5 (12.20%)	2 (4.88%)	1 (2.44%)	1 (2.44%)	9 (21.95%)
48-59	6 (14.63%)	4 (9.76%)	4 (9.76%)	0	14 (34.15%)
Total	18 (43.90%)	7 (17.07%)	13 (31.71%)	3 (7.32%)	41 (100%)

N.B–Total children:106, Total studied children:45, 65children were excluded because their parents did not give consent.

The above table showed the distribution of the studied children of Mawpat block of East Khasi Hills District of Meghalaya based on their haemoglobin level. Out of 41 studied children (including both boys and girls), only 18 were found to be non – anaemic, 17.07% children were identified as mild anaemic and moderate anaemia was observed in 31.71% children, while severe anaemia affected 7.32% of children. Except for severe anaemia, both mild and moderate categories showed a higher prevalence among children. Interestingly, all children in the 24 – 35 months and 36 – 47 months were found to be anaemic, though with varying degrees of severity. Among the children aged 12 – 23 months, 5 children were mildly anaemic and in the age group 6 – 11 months, all the 2 children were found to be moderately and severely anaemic. In the age group of 48 – 59 months, 8 out of 14 children were found to be anaemic with equal prevalence of mild and moderate anaemia.

Table 108: Distribution of Studied Children of Mawsynram Block Based on Haemoglobin Level (WHO, 1968)

Mawsynram					
Age group (in months)	**Normal (11 g/dL or High)**	**Anaemia**			**Total**
		Mild (10 0-10.9 g/dL)	**Moderate (7.0-9.9 g/dL)**	**Severe (lowerthan 7 g/dL)**	
6 - 11	1 (10%)	4 (40%)	5 (50%)	0	10 (15.38%)
12 - 23	4 (50%)	0	4 (50%)	0	8 (12.31%)
24 - 35	6 (42.86%)	3 (21.43%)	5 (35.71%)	0	14 (21.54%)
36 – 47	7 (38.89%)	2 (11.11%)	6 (33.33%)	3 (16.67%)	18 (27.69%)
48 – 59	5 (33.33%)	5 (33.33%)	5 (33.33%)	0	15 (23.08%)
Total	23 (35.38%)	14 (21.54%)	25 (38.46%)	3 (4.61%)	65 (100%)

N.B–Total children:129, Total studied children:65, 64 children were excluded because their parents did not give consent.

The above table presents the distribution of studied children from Mawsynram block of East Khasi Hills District, Meghalaya, based on their haemoglobin levels. Out of 65 studied children (including both boys and girls), 23 children were classified as normal. In contrast, 14 children were found to be mildly anaemic. In the category of moderate anaemia, 25 (38.46%) children were affected indicating that moderate anaemia have the higher prevalence. Interestingly, severe anaemia was only detected among 4.61% children.

Age-specific analysis further highlights critical insights: among children aged 6–11 months, 9 out of 10 (90%) were found to be anaemic with varying degrees of severity, indicating that anaemia begins early in life, possibly due to inadequate iron intake or poor complementary feeding practices. Similarly, in the 12–23 months age group, 4 out of 8 children (50%) were anaemic, underlining the critical need for nutritional interventions during this vulnerable weaning period. A similar trend was observed among children aged 24–35 months, where 78.57% were anaemic, though notably, no cases of severe anaemia were reported, suggesting that while anaemia remains widespread, its intensity may be lower compared to younger age groups. In the 36–47 months age group, 61.11% of children were anaemic, with 2 (11.11%) children identified as mild anaemic, 6 (33.33%) children as moderately anaemic and 3 (16.67%) children identified as severely anaemic, emphasizing that anaemia continues to be a major health issue even in older preschool children. Finally, among children aged 48–59 months, 66.67% were found to be mildly and moderately anaemic.

Overall, the findings indicate that anaemia is highly prevalent among young children in Mawsynram block, with the highest burden observed in the younger age groups (6–35 months). The presence of severe anaemia exclusively among children points out that not only adult women but children are also prone to anaemia. The haemoglobin distribution among children of Mawpat and Mawsynram blocks of East Khasi Hills District reveals a concerning prevalence of anaemia across all age groups, although some distinct patterns emerge between the two blocks. It was found that Mawsynram children are more non – anaemic than Mawpat children with higher number of non – anaemic children 23 being reported from Mawsynram block. The distribution also revealed that children are more anaemic in Mawsynram than in Mawpat. This consistent trend across both blocks suggests that anaemia among young children may be linked to factors such as poor infant and young child feeding practices, limited access to iron-rich foods, and possible recurrent infections, all of which disproportionately impact children during the critical weaning period.

SUMMARY AND CONCLUSION

The present study encompassed a total of 1,641 individuals from Mawpat and Mawsynram blocks, with 848 males and 793 females. Mawpat accounted for a slightly higher number of both males (435) and females (415) compared to Mawsynram (413 males and 378 females). The age range spanned from 0 to 90+ years, categorized into 19 five-year interval groups. In the younger age groups (0–30 years), males outnumbered females, possibly indicating higher male birth rates or better male survival in early life. In contrast, females outnumbered males in the older age groups, which may be attributed to greater female longevity or male out-migration for work.The overall sex ratio of the studied Khasi population was 935.14 females per 1,000 males—lower than both the national average (1,020) and Meghalaya's state average (982) as per NFHS-5 (2019–21). Specific age groups, such as 6–10, 16–20, 36–40, 41–45, and 51–55 years, showed significantly skewed sex ratios, raising concerns about possible gender-based health disparities or reporting biases.

In terms of education, primary education was the most prevalent level attained, followed by middle and secondary education. Mawsynram showed relatively higher representation in higher education levels, including post-graduation and technical/medical degrees. Mawpat, however, showed more individuals with vocational qualifications. Overall, Mawpat contributed 672 individuals (38.64%) and Mawsynram 767 (44.11%) to the total surveyed population.An educational index of the households revealed that the majority were in the "satisfactory" category—16.94% in Mawpat and 24.92% in Mawsynram. However, a notably high proportion of Mawsynram households (18.94%) were categorized as "poor" in educational status compared to only 1.99% in Mawpat. Only Mawsynram had families classified under the "high" educational status.

Regarding occupation, daily wage labour was the dominant form of employment in both blocks (27.94% in Mawpat and 32.18% in Mawsynram). A small percentage were cultivators and business owners. Engagement in private and government services was modest, with slightly higher representation from Mawpat in both categories.Monthly income data indicated that the majority of families in both blocks earned up to ₹25,000 per month (38.21% in Mawpat and 39.53% in Mawsynram). Higher income brackets showed limited representation, with the highest income groups (above ₹1,00,000) reported only in Mawsynram.Finally, the economic index categorized most households in Mawpat and Mawsynram under "poor" and "satisfactory" economic conditions. Mawpat had 22.92% of households as "poor" and 21.26% as "satisfactory", while Mawsynram had 22.26% "satisfactory" and 13.95% "poor". Mawsynram had a relatively higher proportion of "above average" (8.64%) and "high" (5.32%) economic status households than Mawpat (4.32% and 1.33%, respectively).

The comprehensive assessment of 301 households from Mawpat and Mawsynram blocks in East Khasi Hills district, Meghalaya, reveals notable progress in housing quality, sanitation practices, and hygiene behavior, though with certain disparities between the two regions. Pucca houses accounted for the largest share of dwellings (45.85%), followed closely by semi-pucca houses (42.19%), indicating a substantial shift towards more permanent structures. Mawsynram demonstrated better housing conditions than Mawpat, despite its challenging geographical features and higher rainfall. Roofing materials such as GI metal, asbestos, and tin were most commonly used, and concrete roofs were also fairly widespread. Flooring materials showed variation, with brick and stone dominating in Mawpat and mosaic, tile, or marble being more prevalent in Mawsynram. Almost all households had access to electricity, signaling strong basic infrastructure coverage.

Household cleanliness practices appeared to be culturally ingrained, with a majority of families (77.08%) reporting daily cleaning. Plain water was the most frequently used medium for mopping, although a significant proportion of households, particularly in Mawpat, used disinfectants as well—indicating an increasing awareness of sanitation and disease prevention. In terms of cooking arrangements, 63.12% of households had separate kitchens, suggesting improving infrastructure, though a considerable number continued to cook in the living room. LPG was the most commonly used fuel, reflecting growing access to clean energy sources, but traditional cooking methods such as earthen chullahs and open fires remained in use. Most households used metallic utensils and cleaned them with soap or detergent, indicating high adherence to hygienic cooking practices, although the continued presence of earthen pots points to retained cultural preferences.

Water usage and treatment practices further reflected both advancement and areas of concern. Piped or tap water was the primary source of both household and drinking water, particularly in Mawsynram, while Mawpat reported a unique dependence on purchased water, likely due to local scarcity. Nearly all households practiced water purification, with boiling being the dominant method. However, daily cleaning of water storage containers was limited, raising concerns about secondary contamination. Sanitation practices revealed that Mawpat had better municipal waste disposal services, while Mawsynram relied more on self-managed methods such as burning or burying garbage. Both blocks reported a high prevalence of drainage systems, with a balanced distribution between pucca and kachha drains.

Toilet facilities were largely based on pit latrines with slabs, though pit latrines without slabs were still used, particularly in Mawpat. The availability of flush and western toilets was minimal, and open defecation was reported only in Mawsynram. A major concern was the lack of water within toilets—over 63% of households lacked internal water access, with households relying on external piped sources or even natural sources such as ponds and streams. Mawpat, despite its relative urban proximity, showed higher reliance on natural water sources for toilets than Mawsynram, pointing to gaps in internal water connectivity.

The household hygiene index revealed a largely favorable outcome, with over half of the households classified as having above-average hygiene, and nearly 47% falling under the high hygiene category. Mawpat contributed more significantly to the high hygiene group, while

Mawsynram had a stronger presence in the above-average category. Notably, no household in either block was found to be in the poor hygiene category, highlighting an overall positive trajectory in hygiene awareness and practices. However, the persisting disparities in water access, sanitation facilities, and fuel usage underscore the need for targeted interventions to ensure uniform improvement across both blocks.

An assessment of personal hygiene practices among individuals from Mawpat and Mawsynram blocks in East Khasi Hills district, Meghalaya, highlights an overall high standard of hygiene awareness and behavior across the studied population. A total of 14 hygiene-related variables were considered, covering key daily practices such as hand washing before meals and after defecation, bathing habits, nail trimming frequency, use of footwear, and the type and location of toilet usage. Remarkably, 99.34% of participants reported washing their hands before meals, with only two individuals—both from Mawpat—indicating otherwise. Among those who practiced handwashing, a large majority (93.65%) used soap, while a smaller segment (6.35%) relied on plain water. Bathing practices, assessed across seasonal variations due to the region's high-altitude climate and chilly winters, showed consistency in personal cleanliness regardless of weather constraints.Defecation-related hygiene further reinforced the positive hygiene profile of the population. A majority (92.03%) of individuals used private latrines, while 5.98% relied on shared or community latrines. A very small fraction (1.99%), all from Mawsynram, reported practicing open defecation, underscoring the need for targeted improvements in remote areas. Post-defecation hygiene showed similarly promising trends, with 97.34% of respondents washing their hands afterward, predominantly using soap (87.71%) as opposed to water alone (12.29%). Interestingly, of the eight participants who did not follow post-defecation handwashing, seven were from Mawpat—despite its closer proximity to urban infrastructure and health messaging.The Personal Hygiene Index revealed that none of the participants fell into the poor or satisfactory categories, with 95.02% classified under the high hygiene level and 4.98% under the above average level. While Mawsynram had a slightly higher proportion in the high category, Mawpat showed a marginally greater presence in the above average group. Overall, both blocks exhibit commendable hygiene practices, though targeted efforts in areas like soap use and elimination of open defecation could further improve public health outcomes.

The data highlights menstrual hygiene practices among women from Mawpat and Mawsynram blocks of East Khasi Hills. In Mawpat, sanitary napkins were more commonly used (28.57%), while cloth was preferred in Mawsynram (27.57%), likely due to socio-economic factors. Most women in both blocks changed their menstrual materials three times a day, though a few in Mawpat changed only once. Disposal practices showed that the majority discarded materials in garbage, with fewer opting for burning or burying. Though most women changed their menstrual absorbents at a healthy frequency (three times daily), the continued use and repeated washing of cloth, especially for prolonged periods, raises concerns over potential reproductive or urinary infections. Health issues during menstruation were reported by 38.87% of women, with pelvic or abdominal pain being the most common. Multiple menstrual disorders were more prevalent in Mawpat. Regarding beliefs, 99.01% did not follow any taboos. Many women viewed

menstruation as a symbol of womanhood, while a smaller proportion associated it with pain or divine significance. Social attitudes appear progressive, with very few women following taboos and most expressing positive or neutral views toward menstruation, viewing it as a symbol of womanhood rather than stigma. These findings reflect a mix of advancement and persistent challenges, pointing to the need for improved access to sanitary products, better education on hygiene and waste disposal, and increased reproductive health services in rural areas.

The data highlights prevalent addiction practices among women in the East Khasi Hills district, with chewing—primarily of betel nut—being the most common form (76.74%). Only a small fraction (0.66%) reported both chewing and drinking habits, while 22.59% of women reported no addiction. Among the addicted women (n=231), the vast majority (94.81%) use only betel nut, and a small proportion (5.19%) combine it with tobacco. In terms of frequency, nearly half (47.62%) consume betel nut and leaf 1–3 times daily, followed by 32.90% who do so 4–6 times, while smaller percentages consume it more frequently, up to 10–15 times a day.The findings reveal that substance use, particularly the chewing of betel nut, is highly prevalent among women in the East Khasi Hills district. This widespread practice suggests a strong cultural or habitual inclination toward chewing, possibly linked to social customs or perceived benefits such as stress relief or oral stimulation. The minimal presence of alcohol or combined substance use indicates that addiction in this region is largely centered around chewing rather than drinking. The high frequency of daily betel nut consumption among a significant proportion of women raises concerns about potential health risks, including oral and digestive tract issues. Moreover, the low percentage of women without any addiction underlines the need for targeted awareness programs focusing on the long-term health implications of such habits and promoting healthier lifestyle alternatives.

Overall, Mawsynram block recorded a slightly higher number of both live births and surviving children compared to Mawpat, for both male and female children. While the majority of live-born children survived in both blocks, there is a small gap between the number of live births and surviving children, indicating some level of child mortality.The reproductive loss data further reveals that a total of 74 mothers from both blocks experienced one or more losses. The most common experience was a single reproductive loss, reported by 36.49% of mothers from Mawpat and 41.89% from Mawsynram, suggesting that while reproductive loss is present, repeated losses are relatively less frequent. However, a small proportion of mothers reported experiencing multiple losses (up to five), indicating that some women are at higher risk for poor reproductive outcomes and may require closer medical and social support.This pattern of reproductive loss, though not uncommon in rural and underserved regions, calls for improved maternal and child health services, early antenatal care, and nutritional interventions to reduce such losses in future pregnancies.

A majority of pregnant women (over 80%) visited healthcare providers early in their pregnancy, mostly during the 1st–4th months, reflecting good health-seeking behavior. However, a small percentage delayed their first visit until the later stages of pregnancy, and a few did not seek medical consultation at all, raising concerns about maternal health awareness or access in specific cases.

Most women preferred government healthcare services, with 90.48% consulting government staff such as ASHA workers or visiting PHCs/CHCs, indicating trust in public health institutions. Preference for delivery also leaned heavily toward government hospitals (73.33%), although a small portion still chose home deliveries, often seeking comfort and support from family members or traditional birth attendants.In terms of delivery assistance, the majority (84.44%) expected a doctor to facilitate the birth, reflecting a preference for institutional delivery. A minor fraction still relied on traditional dais or family members, which may relate to cultural norms or logistical issues.The haemoglobin levels of the pregnant mothers further reflect mixed maternal nutritional status. While 44.44% of mothers had normal haemoglobin levels, a significant number, particularly in Mawpat block, suffered from moderate anaemia, indicating a nutritional burden. Mild anaemia was slightly more prevalent among younger mothers (17–27 years) in Mawpat, while moderate anaemia was equally distributed among middle-aged mothers in both blocks. Notably, no cases of severe anaemia were recorded, suggesting that although anaemia is present, it has not reached critical levels.Together, these findings underscore positive trends in maternal healthcare utilization but also highlight the need for targeted interventions in nutrition, early antenatal care, and awareness, especially among high-risk or underserved groups.

The nutritional and health status of children from the Mawpat and Mawsynram blocks of East Khasi Hills District reveals significant disparities between the two regions, as well as gender and age-specific variations. In terms of height-for-age (stunting), children from Mawpat show relatively better outcomes, with a higher proportion of both boys and girls falling in the normal range and an absence of severe stunting. Only a small percentage of children from Mawpat experienced moderate stunting, particularly in the oldest age group (48–59 months). In contrast, stunting is more prevalent in Mawsynram, where both moderate and severe stunting are notably higher, especially among boys. This indicates a more pronounced chronic undernutrition problem in Mawsynram compared to Mawpat.Weight-for-age (underweight) patterns reflect a similar trend, with Mawpat children again faring better. Girls in particular exhibit healthier weight-for-age measurements than boys. Severe underweight cases are seen only among boys in Mawpat, while in Mawsynram, boys are more affected by both moderate and severe underweight than girls, suggesting gender-specific vulnerability, possibly due to differential care practices or biological susceptibility.The assessment of height-for-weight (wasting), which indicates acute malnutrition, shows that girls in Mawpat perform better than boys. However, girls also exhibit slightly higher rates of severe wasting, possibly pointing to short-term nutritional stress. In Mawsynram, boys are more severely affected by wasting, particularly in the older age groups, while younger girls also show signs of severe wasting. This distribution highlights the need for targeted intervention based on age and gender.Anaemia levels among children in both blocks are alarmingly high. In Mawpat, most children are anaemic, with moderate anaemia being most

common, and a few cases of severe anaemia present. Children aged 24–47 months are entirely anaemic, indicating a significant public health issue. In Mawsynram, although a slightly higher number of children are non-anaemic compared to Mawpat, the overall anaemia burden remains substantial. Particularly concerning is the very high rate of anaemia in the 6–35 month age group, with 90% of children aged 6–11 months showing some level of anaemia, highlighting critical iron and micronutrient deficiencies during infancy and early childhood.

In conclusion, children in Mawpat block generally demonstrate better nutritional and health outcomes than those in Mawsynram. Girls across both regions tend to be healthier than boys in terms of anthropometric measures. However, anaemia is widespread and severe among all children, especially in the crucial early years. These findings underscore the urgent need for block-specific and gender-sensitive nutrition programs, early childhood health interventions, and broader public health strategies to address both chronic and acute forms of malnutrition in East Khasi Hills.

RECOMMENDATION FOR POLICY IMPLEMENTATION

1. Promotion of early registration of pregnancy, provision of Mother and Child Protection Cards, and regular antenatal check-ups for all pregnancies, leveraging national programs like the National Health Mission and Pradhan Mantri Surakshit Matritva Abhiyan (PMSMA). This should include mandatory haemoglobin screening and timely interventions for anaemia. It will strengthen early and quality antenatal care.

2. Focusing maternal nutrional status and anemia control, implementation of a comprehensive package for anaemia prevention, including universal iron–folic acid supplementation (IFA), deworming, micronutrient fortification of staple foods, and nutrition counseling, with a focus on middle-aged mothers and those with multiple pregnancies may be proved as beneficial. Promotion of optimal birth spacing and dietary diversity through community engagement may play a key role.

3. Further incentivize institutional deliveries by ensuring all government and accredited private healthcare facilities provide free and quality delivery services. Expanding access to skilled birth attendants and reinforce the role of ASHAs and ANMs.

4. Using national or international anthropometric standards—especially for height-based indicators like stunting—to monitor the nutritional status of Khasi (and other Northeastern tribal) children can be misleading. The Khasi people, like several other indigenous/tribal groups in Northeast India, are characterized by relatively shorter stature as a result of genetic/racial factors. This means their average height-for-age is naturally lower than that of pan-Indian or Western reference populations. Therefore, applying global WHO or pan-India standards via tools like the **Poshan Tracker** can overestimate the prevalence of stunting, and potentially misclassify healthy Khasi children as "chronically undernourished."

Therefore, further research and database development to create **ethnic-specific growth charts** or reference standards for tribal/indigenous populations like the Khasi is utmost important. Moreover, apart from height-for-age (stunting),weight-for-height (wasting), weight-for-age (underweight), and most crucially, clinical and functional indicators (e.g., anaemia, micronutrient deficiencies, cognitive and motor development)by combining anthropometry with dietary intake, health, and functional outcomes for a more holistic assessment may emphasize a multi-indicator approach.

Additionally, this study highlights the need for further research on the prevalence and associated factors of anaemia among mothers and children in the Khasi community of Meghalaya. Despite the implementation of several government schemes, anaemia continues to persist in the region, indicating a need to investigate the barriers to its eradication. Future studies should include dietary analysis and consider deeper socio-economic and cultural factors to better understand the underlying causes and develop more effective, community-specific interventions.This study will be extended to a molecular study on anemia to investigate genetic predisposition would focus on identifying and characterizing specific gene variants that increase susceptibility to various forms of anemia.By combining molecular genetic analysis with clinical and demographic data, such a study can clarify the genetic architecture underlying anemia, aid in personalized risk assessment, and inform both diagnosis and targeted interventions in at-risk populations. Such research would align well with the Government of India's ***Anemia Mukt Bharat*** Mission, contributing to targeted, community-sensitive strategies for improving maternal and child health outcomes.

References

1. Acharjee, R. (2020). Determinants of anaemia among children aged under-five years in Meghalaya, India.
2. American Diabetes Association. (2022). Standards of medical care in diabetes—2022 abridged for primary care providers. *Clinical Diabetes*, *40*(1), 10-38.
3. Bagga, A., & Kulkarni, S. (2000). Age at menarche and secular trend in Maharashtrian (Indian) girls. *Acta Biologica Szegediensis*, *44*(1-4), 53-57.
4. Baidya, P., Chutia, D., Sudhakar, S., Goswami, C., Goswami, J., Saikhom, V., & Sarma, K. K. (2014). Effectiveness of fuzzy overlay function for multi-criteria spatial modeling—a case study on preparation of land resources map for Mawsynram Block of East Khasi Hills District of Meghalaya, India. *Journal of Geographic Information System*, *6*(06), 605.
5. Brahmanandam, N., & Nagarajan, R. (2021). Impact of change in household hygiene conditions on morbidity in India: Evidence from longitudinal survey. *Clinical Epidemiology and Global Health*, *11*, 100793.
6. Chandna, R. C. (2009). *Geography of Population: Concepts Determinants & Patterns*. Kalyani Publishers.
7. Das, P., & Nagar, S. (2021). Food habits of people in Meghalaya and its effect on health of women and children. *Int J Curr Microbiol App Sci*, *10*(01), 2581-2587.
8. De Benoist, B., Cogswell, M., Egli, I., & McLean, E. (2008). Worldwide prevalence of anaemia 1993-2005; WHO Global Database of anaemia.
9. Dey, S., Goswami, S., & Dey, T. (2013). Identifying predictors of childhood anaemia in North-East India. *Journal of health, population, and nutrition*, *31*(4), 462..
10. Gautam, S., Min, H., Kim, H., & Jeong, H. S. (2019). Determining factors for the prevalence of anaemia in women of reproductive age in Nepal: Evidence from recent national survey data. *PloS one*, *14*(6), e0218288.
11. Hamal M, Dieleman M, De Brouwere V, & de Cock Buning T (2020). Social determinants of maternal health: a scoping review of factors influencing maternal mortality and maternal health service use in India. *Public Health Reviews*, 41(1). 10.1186/s40985-020-00125-6.
12. Hsieh, S. D., Yoshinaga, H., & Muto, T. (2003). Waist-to-height ratio, a simple and practical index for assessing central fat distribution and metabolic risk in Japanese men and women. *International journal of obesity*, *27*(5), 610-616..
13. https://www.census2011.co.in/census/state/meghalaya.html#:~:text=Meghalaya%20Sex%20Ratio%202024,per%201000%20males%20in%20Meghalaya.
14. https://www.google.com/maps/place/East+Khasi+Hills,+Meghalaya/@25.4002454,91.4618903,75049m/data=!3m1!1e3!4m6!3m5!1s0x37507e9cbbb1ee91:0x867a91ee40f12b4!8m2!3d25.3681768!4d91.7538817!16zL20vMDVuNjhq?entry=ttu accessed on 1st July 2025, at 15:00pm.

15. International Institute for Population Sciences (IIPS) and ICF. National Family Health Survey (NFHS- 4), 2015- 2016. India.
16. Kapoor, S., Tyagi, R., Saluja, K., Chaturvedi, A., & Kapoor, A. K. (2009). Nutritional profile and socio-economic status of Saharia, a primitive Tribe of India. *The Open Anthropology Journal*, *2*(1).
17. Khatoon, T., Verma, A. K., Kumari, R., Rupani, R., Singh, M., & Rizvi, A. (2011). Age at menarche and affecting bio-social factors among the girls of Lucknow, Uttar Pradesh. *Journal of Indian Academy of Forensic Medicine*, *33*(3), 221-223.
18. Khongsdier, R., & Mukherjee, N. (2003). Growth and nutritional status of Khasi boys in Northeast India relating to exogamous marriages and socioeconomic classes. *American Journal of Physical Anthropology: The Official Publication of the American Association of Physical Anthropologists*, *122*(2), 162-170.
19. Khongsdier,R. (2002). Demographic and health traits in relation to maternal education in Northeast India. *The NEHU Journal*, 1:109-135
20. Kumar, A., Oswal, K., Singh, R., Kharodia, N., Pradhan, A., Sethuraman, L., & Purushotham, A. (2021). Assessment of areca nut use, practice and dependency among people in Guwahati, Assam: a cross-sectional study. *ecancermedicalscience*, *15*.
21. Kumar, M. M., Pathak, V. K., & Ruikar, M. (2020). Tribal population in India: A public health challenge and road to future. *Journal of family medicine and primary care*, *9*(2), 508-512.
22. Madankar, M., Kakade, N., Basa, L., & Sabri, B. (2024). Exploring Maternal and Child Health Among Tribal Communities in India: A Life Course Perspective. *Global journal of health science*, *16*(2), 31.
23. Madhusudan, J. V., Yadav, J., Singh, K. J., & Das, U. D. (2018). Prevalence and determinants of anemia among school going children in Meghalaya.
24. Mahanta, B., Phukan, N., Mohapatra, P. K., & Mahanta, J. (2015). Betel nut chewing habit and its determinants among adolescent boys and girls in an industrial town of Assam, India. *International Journal of Health Sciences and Research*.
25. Majeed, J., Sharma, P., Ajmera, P., & Dalal, K. (2022). Menstrual hygiene practices and associated factors among Indian adolescent girls: a meta-analysis. *Reproductive health*, *19*(1), 148.
26. Ministry of Health and Family Welfare, National Family Health Survey- 4, 201502016: State Fact sheet.
27. Ministry of Tribal Affairs. (2023). *Ministry of Tribal Affairs Annual Report*. Retrieved from https://tribal.nic.in/downloads/Statistics/AnnualReport/AREnglish2122.pdf
28. Ministry of Women and Child Development, GOI, 2022
29. Mohan, P., & Kumar, R. (2019). Strengthening primary care in rural India: Lessons from Indian and global evidence and experience. *Journal of Family Medicine and Primary Care*, *8*(7), 2169-2172.

30. Mondal, N. (2014). Thinness as Major Underlying Problem Among Adolescents of Northeast India. *Journal of Nepal Paediatric Society*, *34*(1).
31. Mou TJ, Afroz KA, Haq MA, Jahan D, Ahmad R, Islam T, Chowdhury K, Kumar S, Irfan M, Islam MS, Islam MF, Adnan N, Haque M. The Effect of Socio-Demographic Factors in Health-Seeking Behaviors among Bangladeshi Residents during the First Wave of COVID-19. *Healthcare (Basel). 2022 Mar 4;10(3):483. doi: 10.3390/healthcare10030483. PMID: 35326961; PMCID: PMC8949002.*
32. Nagral K. Concept of safe motherhood in Ayurved. *J Family Welfare* 1997; 42(2): 53-58.
33. National Family Health Survey (NFH4) 4. International Institute for Population Sciences; 2015: State Fact sheet Gujarat. Ministry of Health and Family Welfare. http://rchiips.org/NFHS/pdf/NFHS4/GJFactSheet.pdf.
34. National Family Health Survey (NFH5) 5. *International Institute for Population Sciences; 2019-2020: State Fact sheet Meghalaya.*Ministry of Health and Family Welfare. Meghalaya-nhfs.pdf.
35. National Health Mission. Nhm.gov.in/index1.php?lang = 18 level= 38 sublinked = 1179 & lid = 363. Updated on 15 May 2024.
36. Nguyen, C. B. P., Deitchler, M., & Maalouf-Manasseh, Z. (2017). United States Government.
37. Pandey, M., & Pradhan, A. (2017). Age of attainment of menarche and factors affecting it amongst school girls of Gangtok, Sikkim, India. *Int J Contemp Pediatr*, *4*(6), 187-92.
38. Priyadarshi M, Balachander B, Gupta S, & Sankar MJ (2022). Timing of first bath in term healthy newborns: A systematic review. *Journal of Global Health*, 12, 12004. 10.7189/jogh.12.12004
39. Rao, K.M., Kumar, R.H., Venkaiah,K., and Brahman, G.N.V. (2006). Nutritional Status of Saharia – A Primitive Tibe of Rajasthan. *National Institute of Nutrition, Indian Council of Medical Research. Journal of Human Ecology., 19 (2):117 – 123 (2006).*
40. Rohatgi, S., Suri, S., & Kumar, P. (2021). Trends of malnutrition from 1947-2021 among under-five children in India. *Current Medicine Research and Practice*, *11*(6), 269-279.
41. Sabri B, Khan NA, Tahir M, Khan MA, & Khan MN (2023). Impact of domestic violence on maternal and child health and well-being in rural India. *Journal of Family Violence*. 10.1007/s10896-023-00598-4.
42. Saha, S., & Roy, S. (2022). Menarcheal Age Variation Between Chakma Tribal and Bengali Non-Tribal Girls of Tripura, North-East India. *American Journal of Biomedical and Life Sciences*, *10*(6), 168-175.
43. Sanneving, L., Trygg, N., Saxena, D., Mavalankar, D., & Thomsen, S. (2013). Inequity in India: the case of maternal and reproductive health. *Global health action*, *6*(1), 19145.
44. Saroha, J. (2018). Types and significance of population pyramids. *World Wide Journal of Multidisciplinary Research and Development*, *4*(4), 59-69.

45. Singh, V. (2020). Maternal Health Situation in North-East India: A Case Study of the Khasis. *Online Journal of Health and Allied Sciences*, *19*(2).
46. Sun. D (2016), Khasi of Meghalaya. Differential Reproduction and Family Planning. B. R Publishing Corporation, Delhi, ISBN 9789350502501
47. Tang AM; Chung M; Dong K.R; Bahwere P; Bose K; Chakraborty R; Charlton K; Das P; Ghosh M; Hossain I; Nguyen P; Patsche C.B; Sultana T; Deitchler M; Manasseh Z.M. (2020). Determining a global mid-upper arm circumference cut-off to assess underweight in adults (men and non – pregnant women). *Public Health Nutrition. 2020; 23(17):3104-3113.*
48. The Expert Committee on Tribal Health. (2023). *Tribal Health Report, India – First Comprehensive Report on Tribal Health in India*. Retrieved from https://tribalhealthreport.in
49. The work of WHO.(1968). *Annual report of the Director-General to the World Health Assembly and to the United Nations.*
50. UNICEF. "The State of the World's Children 2008." 2007. https://www.unicef.org/reports/state-worlds-children-2008
51. Vivas, A., Gelaye, B., Aboset, N., Kumie, A., Berhane, Y., & Williams, M. A. (2010). Knowledge, attitudes, and practices (KAP) of hygiene among school children in Angolela, Ethiopia. *Journal of preventive medicine and hygiene*, *51*(2), 73.
52. Wagh, R. V., Upadhye, A. J., & Upadhye, J. J. (2018). Menstrual hygiene practices in young girls of urban India. *International Journal of Reproduction, Contraception, Obstetrics and Gynecology*, *7*(5), 1897-1902.
53. War, R. J., Gharat, V. V., Chandramouleeshwaran, S., Nayak, S., Nimgaonkar, V. L., & Devi, S. (2020). A three-site study of alcohol consumption among adolescents from indigenous tribes in India. *Indian Journal of Psychological Medicine*, *42*(6_suppl), S51-S56.
54. WHO Expert Consultation. (2004). *Appropriate body-mass index for Asian populations and its implications for policy and intervention strategies.* Lancet. 2004 Jan 10;363(9403):157-63. doi: 10.1016/S0140-6736(03)15268-3. Erratum in: Lancet. 2004 Mar 13;363(9412):902. PMID: 14726171.
55. World Health Organization (2023), *Trends in maternal mortality 2000 to 2023* World Health Organization.
56. World Health Organization. (1995). Physical Status: The Use and Interpretation of Anthropometry: Report of a WHO Expert Committee.
57. World Health Organization. (1995). Physical Status: The Use and Interpretation of Anthropometry: Report of a WHO Expert Committee.
58. World Health Organization. (2006). *WHO child growth standards: length/height-for-age, weight-for-age, weight-for-length, weight-for-height and body mass index-for-age: methods and development*. World Health Organization.

59. World Health Organization. (2009). *WHO child growth standards and the identification of severe acute malnutrition in infants and children: joint statement by the World Health Organization and the United Nations Children's Fund*.
60. World Health Organization. (2011). *Waist Circumference and waist-hip ratio: report of a WHO expert consultation.*
61. World Health Organization. (2015). *World report on ageing and health*. World Health Organization.
62. www.mapsofindia.com accessed on 16th May 2024, at 15:05pm
63. www.statisticalhandbookmehgalaya2022.com accessed on 16th May 2024, at 15:10pm
64. Żegleń, M., Marini, E., Cabras, S., Kryst, Ł., Das, R., Chakraborty, A., & Dasgupta, P. (2020). The relationship among the age at menarche, anthropometric characteristics, and socio-economic factors in Bengali girls from Kolkata, India. *American Journal of Human Biology*, *32*(4), e23380.

Photos of fieldwork

Plate I: Road that lead to the villages in East Khasi Hills

Plate II: House type in the villages of East Khasi Hills

Plate III: Source of water for domestic purposes in the villages of East Khasi Hills

Plate IV: A government school in one of the villages of East Khasi Hills

Plate V: Kitchen hearth in a Khasi household

Plate VI: Water storage utensils used in a Khasi household

Plate VII: Type of toilet in a Khasi household

Plate VIII: A Khasi woman returning from the fields

Plate IX: Khasi children

Plate X: Researcher interviewing a Khasi woman participant

Plate XI: Researcher taking anthropometric measurement of a Khasi woman participant