ORIGINAL ARTICLE

# Association of Infant and Young Child Feeding (IYCF) Practices With Nutritional Status of Slum Residents of Lahore

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## ABSTRACT

This world which is now a changed and highly advanced version of people is really ambitious to know about calories and nutrients intakes of its people. Abnormal intake of food is that condition which is non-reversible and also has serious devastating effect on population of each group of age. But if we consider its effect on children, that is highly complicated and such as growth retardation, severe body muscle depletion and insufficiencies of necessary nutrients that results serious bodily and mental retardation for long period of time. Awkwardly, our Pakistan is the country that has to face these types of miseries related to newborn child nutrition status and health problems. These problems are increasing day by day due to inappropriate check and balance of nutrients intake of this age group by the government and also by the parents too. Survey of Pakistan that held in two thousand and eleven indicated that approximately 44% of all young child are facing growth retardation and 15% are underweight. According to this survey, 50% kids have iron deficiency and most probably 33% are facing iron deficiency related health problems. Approximately two fourth of population are facing difficulty of food shortage that lead to poor life standard and poor health. Total evaluation of this report stated that twenty tree to thirty two million inhabitants of Pakistan living in slum areas. International data (MICS (UNICEF) is conferringthat rate of early breastfeeding in Pakistan is 18%. There is a need to assess the nutritional status of children aged less than 2 years in light of IYCF practices of their mothers residing in slum areas of Lahore.
**Keywords:** Malnutrition, infants, young child, feeding practices

## INTRODUCTION

One society's prosperity is totally dependent on many social factors rather than one and only financial aspect. There are many social aspects that are necessary for welfare and prosperity of community such as level of schooling, health and lifespan. [1]If we consider about health status of modern countries then we are concluded that they are highly sensible for their daily caloric and nutrients intake because these things are as necessary as financial factors. If health rate higher then morbidity rate then automatically economy can grow. Abnormal intake of food is that condition which is non-reversible and also has serious devastating effect on population of each group of age. But if we consider its effect on children, that is highly complicated and such as growth retardation, severe body muscle depletion and insufficiencies of necessary nutrients that results serious bodily and mental retardation for long period of time[2]. The survival of the of young children nutritional status is based on translating the acquired knowledge of early mother's milk feeding, including continuous breast feeding for birth to six months and sustainedit till 24 months along with age appropriate complementary feeding, into the practice as suggested in the conclusions of WHO's Global Consensus meeting held on November 6-8, 2007 regarding the indicators for assessing IYCF practices in early childhood[3].

Awkwardly, our Pakistan is the country that has to face these types of miseries related to newborn child nutrition status and health problems. These problems are increasing day by day due to inappropriate check and balance of nutrients intake of this age group by the government and also by the parents too. Survey of Pakistan that held in two thousand and eleven indicated that approximately 44% of all young child are facing growth retardation and 15% are underweight. According to this survey, 50% kids have iron deficiency and most probably 33% are facing iron deficiency related health problems[4].

Abnormal feeding in kids of zero to two years is the result of inappropriate food intake, pathetic self-hygiene, proper education, and parental self-practices. This condition is more severe in shanty town new born babies and kids are at high peak of under nutrition urban Shanty towns due to less knowledge of how to proper feed these age groups. These areas also have lack service of health practitioners[5].

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Total evaluation of researches stated that twenty tree to thirty two million inhabitants of Pakistan living in shanty towns. According to Lahore development authority, about 30% community of Lahore is living in shanty towns. In these areas, many factors that are elaborated above (less knowledge, income crises, self-cleanliness) are causing highly contagious diseases such as lose motion and acute respiratory infections (ARI). Parental practices of self-hygiene, affection towards child's food preparation and feeding are some important factors to assess the nutritional status of young babies[6].

International data (MICS) (UNICEF) is conferring that rate of early breast feeding in Pakistan is 18%. This report also stated that early mother's milk intake and continuous feeding rate are correspondingly 38% and 56%. Inappropriate infants feeding applies are major cause of malabsorption and malnutrition syndrome. Cultivation and food stuff controlling authorities announces health status is too poor in every five child of Pakistan's population according to their nutrition status. It is the need of time to measure the nutrients intake of these children and new born babies especially from slum areas to overcome the situation of malnutrition in this age group[7].

According to estimation approximately 30% of population in Lahore is sitting in shanty towns and there basic and necessary services of life and the most special one is good and appropriate nutrients intake are totally conceded. Most hunting community in slum areas is kids of two years or younger are due to poor nutrition and malabsorption cases. These conditions are leading them to underweight and poor growth syndrome. Early mother's milk feeding for very first six years, continuous feeding for twenty four months and health weaning practices can save the child from such miseries. These method of eating can also helpful to increase the life expectancy of new born and child with a healthy life period and less chances of viral or bacterial infections. These conditions of slum areas in Lahore put more pressure to assess the nutritional status of infants and children of less than two years[7].

This research was planned to explore the nutrient and caloric intake of newborn infants and child and also assess their body nutritional level specifically in shanty towns of Lahore. All-inclusivevaluation of the corresponding parental self-hygiene and affection to make food and eat the baby well is completed to recommend the government to recovernewborn babies and child feeding practices, residence circumstances in shanty areas and many

other factors that clearly hit the health and nutritional status of young infants.

## METHODOLOGY

**Selection Criteria:** Required facts were drawn from those women who are having the newborn or older child of two years, their residence in shanty towns of Lahore. Theyshowed their concern to participate in this research. Women who supposed to be not settled for this research are omitted from thislearning. Paramedical staff assistance was employed for gatheringrequired facts of mothers related to conditions of life in shanty towns. Ethical review board of University of Veterinary & Animal Sciences, situated in Lahore was approved the Present research.

**Study Design:** Present cross-sectional research emphasized on the gathering required facts from four hundred women who carry zero to two years old baby specifically belong to shanty areas of Lahore. For this research an easy and dual language holding questionnaire forms were used that fulfill the criteria of world health organization for assessing nutrients intake and health status of this age group. Form was developed according to needed information of the study i.e. study variables that include the indicators for assessing the nutritional status, breastfeeding practices and complementary feeding practices of 0-24 month's children. Both the qualitative and quantitative parameters were administered to the mothers or caregivers of children between 0-24 months. Data was computed using five components of the questionnaire namely; household's socio-economic information, general hygienic and sanitation practices, child's profile with overall health status, breastfeeding practices and complementary feeding practices. Each section of the questionnaire further divided into various questions some of which were categorized and others were open ended as under:

1. Household's Socio-Economic information was collected by asking the mothers about her family structure, gaps (in years) between last two consecutive children, monthly family income as well as marital, educational and occupational status of parents etc.
2. Hygienic practices were assessed by collecting the response from mothers regarding children vaccination status, sanitary and toiletry facilities available in the house and the type of water they are drinking in home etc.
3. Overall health status of children was computed by measuring child's nutritional status as well as through the frequency of diarrhea and acute respiratory infections during previous three months (i.e. rates of acute malnutrition as affected by severity and duration of infections).
4. Information of breastfeeding practices was compiled from the knowledge, attitude and practices of mothers regarding early initiation of breastfeeding, exclusive and continued breastfeeding, initiation of solid and semi-solid foods or weaning etc.
5. Complementary feeding practices were assessed through the composite indictor i.e. minimum acceptable diet (MAD) for which the dietary diversity and meal frequency of previous day were calculated by using food group frequency questionnaire as per W.H.O.

**Sampling Technique:** Total population of Lahore according to recent census is about 11.12 million. According to Lahore Development Authority, 30% of Lahore's population i.e. 3.33 million is living in registered slums surrounding the city. Of that 30% Lahore's population 6.5% was computed as the population children below 2 years since according to data collected authority of Pakistan, around 6.5% in popular sites of Pakistan consisted the kids younger than two viz. 217035. Sample size (n) was calculated by keeping the p=0.05 or 95% confidence interval

| Population | Numbers | References |
|---|---|---|
| Lahore's current population: | Eleven million | Pakistan Bureau of Statistics |
| 30% for slum dwellers: | Three million | Lahore Development Authority |
| 6.5% for 1-2 years children: | 217035 | Pakistan Bureau of Statistics |
| Sample size (n): | 384 ≈ 400 | openepi.com |

**Study Variables:**
**Nutritional status of children was assessed on the basis of following indicators:**
- Weight of children measured by using a baby weight scale (ROSSMAX WE-300)
- Lengths were taken by a light and stable length measuring board for mobile use (SECA 417)

- Weight for length Z-scores (WLZ) of both male and female of children were calculated separately from a computer software for anthropometric measurements (WHO Antrho) available at WHO's official website
- o Z-Score: Below -3 SD from world health organization criteria showed newborn and kids are supposing severe acute malnutrition or less than two standard deviation to demonstrate showing moderate acute malnutrition
- MUAC of children were calculated using specific tapes of WFP (MUAC tape for children)
- MUAC value less than 11.5cm identifies children having SAM and MUAC value between 11.5cm and 12.5cm indicated as MAM.
- o Water retention level in body: to check through putting pressure in ankle and assess its severity
- o Body well-being Status: depend upon the viral and bacterial infections of GIT and respiratory tract over last three months

***IYCF Practices of the mothers was assessed by asking following information from mothers:***
- Giving first milk that mother's body produces after birth (0-23 months)
- Necessary to start breastfeeding within one hour after birth (zero to twenty three months)
- Preliminary mother's milk feeding (zero to six months)
- Continue this feeding up to 1 year (twelve to fifteen months)
- Weaning is starting at the age of six to nine months
- Dietary modification at minimum level ( six to twenty three months)
- Meal regularity (six to twenty three months)
- Tolerable level of food ( six to twenty three months)

Responses from forms were gathered, excluded and revised. These are the results of assessing body nutrients intake and reserved level of newborn babies and adult child of zero to two years. Many social and economic factors are effected these results.

**Statistical Tools:** Significant variations were analyzed by using appropriate statistical tests. To specify the population data, statistical tools like specify the one number as whole representative regularity dispersal, percentages, overall sum, , mode, quartiles and data set with probabilityof specific value were calculated. These parameters show the association of IYCF practices on overall health status, subdivision is taken of data in 2 slots based on age cluster i.e. 0-6 months and 6-24 months. Status of accuracy had set down as calculated p value of 0.05. Chi-square analysis for all categorical variables and regression analysis of quantitative data (scale data) was performed. Crosstabs with adjusted residues of different associations were drawn to show the prevalence of each parameter under gradual increase in severity of malnutrition (Pos-hoc analysis). Then p values of respective variables were calculated and compared with level of significance taken as 0.05 (C.=95%). Sum and clarification of facts done by using SPSS Vr 22.

## RESULTS

Mean oldness of mothers was 26.0±5.13 years. 325 of 400 mothers interviewed had more than one child with the mean gap of 2.0 ± 1.1 years between consecutive last two pregnancies. Majority of them had only the gap of one year between their last two children. Among 400 children, 198 were male and 202 were female. Age wise, 90 were of less than 6 month, 145 were of 6-12 months, 165 were between 12-24 months and 310 children were between 6-24 months.

**Household Socio-Economic and Children Nutritional Status:** About 41% mothers (162 of 400) were found illiterate, while 29% and 30% were having primary to middle level and matric or above level of education, respectively. Though maternal education was not significantly (P=0.078033) related to body nutrients intake level in babies and kids , still cross tabulation analysis showed that the prevalence of normal body nutrients intake level in babies and kids was higher through gradual increase with educational status of mothers i.e. 59.3% with illiteracy, 70.1% with primary-middle level and 71.1% with Matric or above. Similarly, 46% and 27% fathers were illiterate or having education level between primary to middle, respectively.

Regarding occupation, majority of mothers (374 out of 400) were house wives and 56% of fathers were earning on daily wages which resulted in the net family income of 56% (223/400) studied population equals to less than Rs.15000/ month. These low stats of monthly income in urban slums of Lahore found highly associated (P=0.000042) with nutritional status of children i.e. out of 223 malnourished children,

98(44.9%) were belonging to families with monthly income <Rs.15000, but only 4(10%) children were suffering from severe and moderate acute malnutrition belonging to families with net income >=Rs.30000/month.

**Hygiene, Sanitary Conditions and Burden of Diseases:** Although, all the households (99%) had at least toilet facility and were using soap for hand washing, drainage pipes or sewerage system were not covered in 9% (36/400) population. Above 73% (293/400) families were using tap water for drinking purpose. Frequencies of diarrhea and acute respiratory infections (A.R.I.) were <3 times during last three months in 72% and 68% children, respectively. Similarly 20% and 26% children had 3-6 times, while 6% and 8% had >6 times of diarrheal and ARI episodes over last three months, respectively. Rate of immunization of children against diarrheal or respiratory infections found to be good in as much as 379/400 (94.7%) population, which was highly associated with less diarrheal (P= 0.000268) as well as A.R.I. (P=0.000069) episodes during last three months.

**Nutritional Status and Breastfeeding Practices (0-24 months)**
Average body massor length of kids was 7.4±2.4 and 71±9.9 centimeter, respectively. Based on WHO derived body mass as compared to length z-scores (WLZ), body nutrient reserved level of 264/400 kids was normal, while 53 and 83 children had moderate and severe acute malnutrition, respectively.

About 5% children showed signs of bilateral edema. Over 90% mothers had knowledge about exclusive and continued breastfeeding. Rate of exclusive breastfeeding was 86.5%. But only 32.7% children were breastfed continually for 12-15 months. No significant associations were found between exclusive (P=0.694309) or continued breastfeeding (P=0.274281) with the children nutritional status. 71.8% mothers put their babies on their breasts within 1 hour of birth, which was highly associated (P=0.002602) with nutritional status showing more prevalence of SAM in children who had not received breast milk within 1 hour. Similarly, a highly significant (P=0.001049) relation found between the provision of colostrum to infants and low prevalence of SAM i.e. 17.5% vs. 38.1% in those who not received colostrum.

**Nutritional Status and Complementary Feeding Practices (6-24 months):** Among 6-24 months age group 43 of 310(13.9%) children had MAM, 54/310 (17.4%) suffering from SAM and nutritional status of 213/310 (68%) children was normal. MUAC of 20% (62/310) children was less than 12.5cm, found highly significant through lesser modification (P=0.000180) and less tolerable level of food (P=0.000079). Amongst; 40% kids' weaning practices started at the age of six to eight months, 15.8% before 4 months and 41.9% between 4-6 months; which was pointedly (P=0.020871) associated with nutritional status. Diet of 73.9% children was minimally diversified, which found highly significant relation with nutritional status (P= 0.000021) and children MUAC (P=0.000180). Cross tabulation showed 24.9% prevalence of acute malnutrition in children receiving the diet minimally diversified vs. 49.3% in children whom diet was not minimally diversified. Meals of 83.2% children were though minimally frequent, but did not found significant association (P= 0.232642) with nutritional status. Meanwhile, MUAC of children was significantly related (P= 0.038672) to MMF. About 66.5% children (206/310) were taking minimally acceptable diet, highly significant (P= 0.001319) with their nutritional status. Cross tabulation showed that the nutritional status of 104 children not receiving minimally acceptable diet was 55.8% normal as compared to 75.2% in 206 children whom diet was minimally acceptable.

Table 1: Age of mothers and the gap between their last two children

| Parameter | | Mothers' Age (Years) | Gap between (Years) |
|---|---|---|---|
| Mean | | 26.35 | 2.0411 |
| Median | | 26.00 | 2.0000 |
| Mode | | 25 | 1.00 |
| Std. Deviation | | 5.139 | 1.1554 |
| Percentiles | 25 | 24.00 | 1.0000 |
| | 50 | 26.00 | 2.0000 |
| | 75 | 30.00 | 2.5000 |

Table 2: Household socio-economic status

| Parameter | Classification | Frequency |
|---|---|---|
| Mothers' Education | Illiterate | 162 |
| | Primary to Middle | 117 |
| | Matric or above | 121 |
| Fathers' Education | Illiterate | 186 |
| | Primary to Middle | 106 |
| | Matric or above | 108 |
| Mothers' Occupation | House Wives | 374 |
| | Working Women | 26 |

| Fathers' Occupation | On Daily Wages | 225 |
|---|---|---|
| | Job Holder | 105 |
| | Self Employed | 70 |
| Mother's Marital Status | Married | 393 |
| | Divorced | 07 |
| | Widow ed | 01 |
| Family Income/ Month | < 15000 | 223 |
| | 15000-30000 | 137 |
| | >30000 | 40 |

Table 3: Hygiene and sanitary conditions

| Parameter | Classification | Frequency |
|---|---|---|
| Vaccination of Children | Yes | 379 |
| | No | 21 |
| Toiletry Facility at Home | Yes | 399 |
| | No | 01 |
| Use of Soap for Hand Washing | Yes | 396 |
| | No | 04 |
| Type of Drinking Water | Tap water | 293 |
| | Boiled/ Filtered | 107 |
| Sewerage System | Covered | 364 |
| | Open | 36 |

Table 4: Gender, age and birth place of children

| Parameter | Classification | Frequency |
|---|---|---|
| Gender | Male | 198 |
| | Female | 202 |
| Age Groups | > 6 months | 90 |
| | 6-12 months | 145 |
| | 12-24 months | 165 |
| | 6-24 | 310 |
| Birth Place | Home | 46 |
| | Basic Health Unit | 63 |
| | Hospital | 291 |

Table 5: Average weight and length of children with respective Z-scores

| Descriptive | | Children Weight (Kg) | Children Length(cm) | Weight for Length (Z-score) |
|---|---|---|---|---|
| Mean | | 7.4393 | 71.6823 | -1.5080 |
| Median | | 7.6000 | 73.0000 | -1.3300 |
| Mode | | 6.30 | 77.00 | -.75 |
| Std. Deviation | | 2.41279 | 9.96644 | 4.87767 |
| Percentiles | 25 | 5.8000 | 65.0000 | -2.5300 |
| | 50 | 7.6000 | 73.0000 | -1.3300 |
| | 75 | 9.2000 | 79.0000 | -.4100 |

Table 6: Children nutritional Status (based on weight for length z-scores)

| Parameter | Classification | Frequency |
|---|---|---|
| 0-6 months (n=90) | MAM | 10 |
| | Normal | 51 |
| | SAM | 29 |
| 6-12 months (n=145) | MAM | 26 |
| | Normal | 87 |
| | SAM | 32 |
| 12-24 months (n=165) | MAM | 17 |
| | Normal | 126 |
| | SAM | 22 |
| 0-24 months (n=400) | MAM | 53 |
| | Normal | 264 |
| | SAM | 83 |
| 6-24 months (n=310) | MAM | 43 |
| | Normal | 213 |
| | SAM | 54 |

Table 7: Middle upper arm circumference (MUAC) and occurrence of edema

| Parameter | Classification | Frequency |
|---|---|---|
| MUAC (6-24 months) | <11.5cm | 05 |
| | 11.5-12.5cm | 57 |
| | >12.5cm | 248 |
| Presence of Edema (0-24 months) | Present | 22 |
| | Not Present | 378 |

Table 8: Average episodes of diarrhea and acute respiratory infections

| Parameter | Classification | Frequency |
|---|---|---|
| Frequency of Diarrhea (over the last 3 months) | < three times | 288 |
| | Three to six times | 81 |
| | > 6 times | 31 |
| Frequency of A.R.I. (over the last 3 months) | <three times | 273 |
| | Three to six times | 102 |
| | >six times | 25 |

Table 9: Breastfeeding practices (0-24 months)

| Parameter | Classification | Frequency |
|---|---|---|
| Breastfeeding practiced | On scheduled timing | 83 |
| | Upon children crying | 245 |
| | Upon mothers desire | 72 |
| Mothers' knowledge about Exclusive Breastfeeding | Yes | 365 |
| | No | 35 |
| Mothers' knowledge about Continued Breastfeeding | Yes | 352 |
| | No | 48 |

| Mothers' knowledge about Breastfeeding Benefits | Yes | 352 |
|---|---|---|
| | No | 48 |
| Provision of Colostrum | Yes | 337 |
| | No | 63 |
| Preliminary start of mother's milk feeding through first hour of birth | Yes | 287 |
| | No | 113 |
| Exclusive Breastfeeding for 0-6 months (n=90) | Yes | 77 |
| | No | 13 |
| Continued Breastfeeding for12-15 months (n=165) | Yes | 54 |
| | No | 111 |

Table 10: Complementary feeding practices (6-24 months)

| Parameter | Classification | Frequency |
|---|---|---|
| Weaning | < 4 months | 49 |
| | 4-6 months | 130 |
| | 6-8 months | 123 |
| | > 8 months | 8 |
| Minimum Dietary Diversity (MDD) | Exists | 229 |
| | Not Exists | 81 |
| Minimum Meal Frequency (MMF) | Exists | 258 |
| | Not Exists | 52 |
| Min. Acceptable Diet (MAD) | Exists | 206 |
| | Not Exists | 104 |

Table 11: Association of nutritional status with household's socio-economic status

| | Maternal Education | Monthly Family Income |
|---|---|---|
| Pearson Chi-Square | 8.398222NS | 25.395429** |
| Likelihood Ratio | 8.277953NS | 27.846722** |
| N of Valid Cases | 400 | 400 |

** = Highly Significant (P≤0.01)          NS = Non-Significant (P>0.05)

Table 12: Association of children nutritional status with burden of diseases

| | Diarrheal Episodes | A.R.I. Episodes |
|---|---|---|
| Pearson Chi-Square | 12.359129* | 22.151645** |
| Likelihood Ratio | 11.045856* | 20.930111** |
| N of Valid Cases | 400 | 400 |

* = Significant (P≤0.05)          ** = Highly Significant (P≤0.01)

Table 13: Effect of diarrheal and ARI vaccination on their respective episodes

| | Diarrheal Episodes (Last three months) | A.R.I. Episodes (Last three months) |
|---|---|---|
| Pearson Chi-Square | 16.451028** | 19.162364** |
| Likelihood Ratio | 14.391902** | 11.572018** |
| N of Valid Cases | 400 | 400 |

** = Highly Significant (P≤0.01)

Table 14: Association of children nutritional status with mothers' breastfeeding practices

| | Provision of Colostrum | Initial mother's milk feeding | Exclusive Breastfeeding (0-6 months) | Continuous mother's milk feeding (12-15 months) |
|---|---|---|---|---|
| Pearson Chi-Square | 13.720128** | 11.903311** | 0.729676 NS | 2.587202NS |
| Likelihood Ratio | 12.188148** | 11.243161** | 0.715302NS | 2.566225NS |
| N of Valid Cases | 400 | 400 | 90 | 165 |

* = Significant (P≤0.05)          ** = Highly Significant (P≤0.01)          NS = Non-Significant (P>0.05)

Table 15: Association of children nutritional status with provision of colostrum

| Provision of Colostrum | Nutritional Status | | | | Total |
|---|---|---|---|---|---|
| | | MAM | Normal | SAM | |
| Given | Count | 46 | 232 | 59 | 337 |
| | Adjusted Residual | .5 | 2.8 | -3.7 | |
| | % within Colostrum | 13.6% | 68.8% | 17.5% | 100% |
| | P -value | 0.58538 | 0.00551 | 0.00022 | |
| Not given | Count | 7 | 32 | 24 | 63(100%) |
| | % within Colostrum | 11.1% | 50.8% | 38.1% | |
| | Adjusted Residual | -.5 | -2.8 | 3.7 | |
| | P -value | 0.58538 | 0.00551 | 0.00022 | |
| Total | Count | 53 | 264 | 83 | 400(100%) |
| | % within Colostrum | 13.3% | 66.0% | 20.8% | |

Table 16: Association of nutritional status with early initiation of breastfeeding

| Breastfeed within 1 hour after birth | Nutritional Status | | | | Total |
|---|---|---|---|---|---|
| | | MAM | Normal | SAM | |
| Started | Count | 41 | 199 | 47 | 287(100%) |
| | % within BF_w1H | 14.3% | 69.3% | 16.4% | |
| | Adjusted Residual | 1.0 | 2.2 | -3.4 | |
| | P -value | 0.33020 | 0.02471 | 0.00059 | |
| Not Started | Count | 12 | 65 | 36 | 113(100%) |
| | % within BF_w1H | 10.6% | 57.5% | 31.9% | |
| | Adjusted Residual | -1.0 | -2.2 | 3.4 | |
| | P -value | 0.33020 | 0.02471 | 0.00059 | |
| Total | Count | 53 | 264 | 83 | 400(100%) |
| | % within BF_w1H | 13.3% | 66.0% | 20.8% | |

Table 17: Association of children nutritional status with exclusive breastfeeding

| Exclusive Breast-feeding | Nutritional Status | | | | Total |
|---|---|---|---|---|---|
| | | MAM | Normal | SAM | |
| Yes | Count | 8 | 45 | 24 | 77(100%) |
| | % within Exclusive Breastfeeding | 10.4% | 58.4% | 31.2% | |
| | Adjusted Residual | -.5 | .8 | -.5 | |
| | P -value | .5961 | .4083 | .6028 | |
| No | Count | 2 | 6 | 5 | 13(100%) |
| | % within Exclusive Breastfeeding | 15.4% | 46.2% | 38.5% | |
| | Adjusted Residual | .5 | -.8 | .5 | |
| | P -value | .5961 | .4083 | .6028 | |
| Total | Count | 10 | 51 | 29 | 90(100%) |
| | % within Exclusive Breastfeeding | 11.1% | 56.7% | 32.2% | |

Table 18: Association of children nutritional status with mothers' complementary feeding practices

| | Weaning | Minimum Dietary Diversity (MDD) | Minimum Meal Frequency (MMF) | Minimum Acceptable Diet (MAD) |
|---|---|---|---|---|
| Pearson Chi-Square | 14.922136* | 21.540695** | 2.916510NS | 13.261777** |
| Likelihood Ratio | 16.145649* | 19.907351** | 2.747045 NS | 12.867409** |
| N of Valid Cases | 310 | 310 | 310 | 310 |

* = Significant (P≤0.05)          ** = Highly Significant (P≤0.01)          NS = Non-Significant (P>0.05)

Table 19: Association of children MUAC with complementary feeding practices

| | Minimum Dietary Diversity (MDD) | Minimum Meal Frequency(MMF) | Minimum Acceptable Diet (MAD) |
|---|---|---|---|
| Pearson Chi-Square | 17.242893** | 6.505256* | 18.895785** |
| Likelihood Ratio | 15.828091** | 5.866380* | 17.964816** |
| N of Valid Cases | 310 | 310 | 310 |

* = Significant (P≤0.05)          ** = Highly Significant (P≤0.01)

## DISCUSSION

Present research had held for elaborating effect of inappropriate parental nourishing methods including breast feeding and complementary feeding practices towards low nutrient intake level of newborn and kids especially from shanty towns of Lahore. The collected data was spitted in two age groups i.e. 0-6 months and 6-24 months and then relation of respective parameters with the nutritional status of children were analyzed and associated with in detail.

Nutrient intake level of newborn and kids based on their body mass for height according to standards were calculated and parental nourishing methods; like early intimation of breastfeeding, provision of colostrum, preliminary mother's milk feeding for early six months, continued breastfeeding for 12-15 months, weaning at six to eight months, minimum dietary diversity, meal frequencies and the rate of less tolerable food level; were assessed and analyzed to check their influence on children nutritional status and burden of diseases.

**Socio-Economic Status:** Socio-economic status was assessed to find the living standards of the deprived slum community with low nutritional status in terms of parent's literacy level and net family incomes per month. Similar trends were seen in this study as in previous ones conducted in India and Bangladesh by (Nimbalkar et al. 2013)[8] and (Senarath et al. 2012a)[9]respectively, regarding the effect of maternal education and household poverty on feeding practices and thus the nutritional status. Though, the percentage of children with normal nutrition status was more in families with better educational status, but no direct association of maternal education with lower prevalence of malnutrition was found as shown by the findings of National Nutrition Survey (NNS) 2011.

**Hygiene Practices and Burden of Diseases:** Hygiene practices including the use of soap for hand washing and availability of toilet were comparatively better in the study population as compared to previous studies (Khan, G. N. et al 2017 )[10]; (Demilew et al. 2017)[11]that summarize the basic problems of urban slums i.e. very poor standards of living with unavailability of basic life facilities. Average episodes of diarrhea and acute respiratory infections found more prevalent and associated with severely acute malnutrition in children of studied population as evident of many previous studies (Demilew YM et al.2017)[11]and (Senarath et al. 2012b)[9]conducted to show the relation between malnutrition and diarrheal and other infections.

**Children Nutritional Status:** The weight for length z-score (WLZ) value of 34% children (136 of 400) was <-2SD from which about 20.7% (83 of 400) had z-score <-3SD. So, this study showed that the prevalence of severe or moderate acute malnutrition in urban slums higher than their prevalence reported NNS 2011, which stated the prevalence of severe body mass deterioration, were highly seen in slum sites (23%) if comparison done with villages (18%) of Pakistan.

**Breastfeeding Practices:** According to this study 84.3% (337 out of 400) mothers gave colostrum to their children as compared to 90% reported by a study (Anees et al. 2015) carried out in developing districts of Pakistan. The present study showed that 287 out of 400 mothers (71.8%) put their babies on their breasts within one hour which was significantly associated with low prevalence of SAM, contrary to the previous study conducted (Das et al. 2013) to find the gap between desired and inappropriate feeding practices and resulted that about 66% mothers did not initiated breastfeeding within one hour. Similarly, Nepal Demographic & Health Survey 2011as analyzed by (Lamichhane et al. 2016) showed that above 50% children did not receive breast milk within one hour of birth. NNS 2011 stated that 40.5% mothers in Pakistan and Punjab had started breastfeeding their babies within 1 hour after birth. Above 90% mothers in studied population had knowledge about exclusive breastfeeding which seemed to be well translated in practice as 86% mothers were exclusively breastfeeding their children more than 65% as reported in NNS 2011. Similar study of Bangladesh (Faruque et al. 2008) concluded that very low rate of exclusive breastfeeding in Dhaka city was raised to 70% by counseling the caregivers about WHO guidelines to achieve optimal nutritional status in children. NNS 2011 statistics revealed that 72% children received continued breastfeeding between 12-15 months in urban areas of Pakistan. Another study (Anees et al. 2015) conducted in Pakistan to relate breastfeeding practices with nutritional status of infant showed 65% mothers continued breastfeeding their children after one year. The low prevalence of continued breastfeeding during 12-15 months found momentous (P=0.000014) with short gaps between last two pregnancies i.e. gap of only one year reported by most of the mothers in studied population.

**Complementary Feeding Practices:** Study data showed that 40% children were introduced to solid or semi-solid foods between 6-8 months while 41% between 4-6 months. NNS 2011 revealed that rate of introduction of solid or semi-solid foods between 6-8 months was about 50%. Similarly, a survey carried out to assess the feeding practices of 565 children <2 years of age in under developed districts of Pakistan (Anees et al. 2015) identified that 38% children were introduced to complementary feeding at 6-8 months. Minimum acceptable diet (MAD) was estimated as a composite indicator of MDD and MMF. Study data showed that diet of about 67% children was minimally acceptable. MAD had highly significant association with MUAC and weight of children with respect to their length. Previous study (Anees et al. 2015) in Pakistan declared that MAD was as low as 10% while NNS 2011 reported only 3.6% children were receiving the diet that was minimally acceptable.

According to estimates, about 23 to 32 million population in Pakistan consists of slum dwellers. According to Lahore development authority, about 30% community of Lahore is living in shanty towns. In these areas, many factors that are elaborated above (less knowledge, income crises, self-cleanliness) are causing highly contagious diseases such as lose motion and acute respiratory infections (ARI). Parental practices of self-hygiene, affection towards child's food preparation and feeding are some important factors to assess the nutritional status of young babies.International data (MICS (UNICEF) is conferring that rate of early breastfeeding in Pakistan is 18%. This report also stated that early mother's milk intake and continuous feeding rate are correspondingly 38% and 56%. Inappropriate infants feeding applies are major cause of malabsorption and malnutrition syndrome. This research was of great significance as it was undertaken to highlight the importance of knowledge of mother about nutritional status and their IYCF practices while targeting the slum population of Lahore. Specifically, the objectives of the study were to assess the nutrients reserved level of kids of zero to two years of age in shanty towns in Lahore, for assessing the newborn babies and child feeding practices of parents concerning health and body nutrients malabsorption of their loved ones and to correlate these with nutrients intake level of kids to suggest government interventions. Nutrient intake level of body in kids was assessed on the basis of weight for length z-scores and middle upper arm circumference (MUAC) for the children (6-24 months). The weight & length were measured using pediatric scale and length board respectively and then their corresponding weight for length Z-scores were calculated.

Similarly, presence of bilateral edema also assessed and MUAC of children above six months were also measured and categorized. IYCF indicators given by WHO were analyzed by asking the mothers about their knowledge and practices regarding breastfeeding and complementary feeding to assess how much the diet of their children is minimally acceptable in terms of dietary diversity and meal frequency.

## CONCLUSION

The research was consisted of the slum resident parents of the children below two years of age. The study shows that most of the parents of slum areas in Lahore are illiterate and are earning on daily wages. There was a close association (highly significant) between household poverty the nutritional status of overall children with low prevalence of malnutrition in children. There is a need to improve socio-economic status of slum dwellers by improving maternal literacy rate, household monthly income and awareness about family planning.

**Conflict of interest:** Nil

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