Innovations

# Nutritional Profile of Anganwadi Children Among 2 to 5 Years of Age Group of Bilaspur, Chhattisgarh

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***Abstract***
***Problem:*** *An Anganwadi center serves the extreme vulnerable and underprivileged sections and provides services exact at the doorsteps of the beneficiaries to ensure their maximum involvement. Poor nutritional status of the child leads to development of infectious diseases which may leads to permanent physical and mental impairment. The objective of the present study is to assess the impact of Anagnwadi centers on nutritional status of studied children.* ***Methodology:****The study is based on cross-sectional method, conducted on 780 children from 50 anganwadi, aged ranged from 2-5 years of Bilaspur, Chhattisgarh India. Anthropometric measurements, socio-demographic profile, facilities provided in ICDS Centers have been collected from anganwadicenters. All statistical analyses have been performed using the Statistical Package for Social Science (SPSS/PC- Version 23).* ***Findings:*** *Present study shows the overall the prevalence of stunting, underweight and wasting are 48.7%, 46.3% and 28.8% respectively which indicates the critical situation of the children. Those children who did not receive regularly supplementary food provided in Anganwadi centers had poor nutritional status than those children who received regularly food.Poor rapport establishment of worker with mothers and children also can be significant factor for the occurrence of undernutrition.* ***Conclusion:****Nutrition surveillance should be done continuously and special attention should be given to such as poorest and the most severely malnourished children. Efforts should be taken to supply food with better quality and variety.*

***Key words:*** *Stunting, Underweight, wasting, integrated child development scheme, Nutrition*

## Introduction

### Integrated Child Development Scheme (ICDS)

WHO slogans say that healthy child is the wealth of a nation. India a developing country covers 40% of undernourished children of the world and under nutrition is largely occurs due to insufficient availability of proper food, early age at marriage and at first birth, gestational age, delivery mode, height and weight of the children, lack of breastfeeding, family size, low birth weight, open defecation and low socio-economic condition of the family, etc. (Khan and Nalli, 2018). Malnutrition is more prevalent especially in central India such as Chhattisgarh and Madhya Pradesh (Dakshayani and Gangadhar, 2015). In India, many recent studies have been conducted on the nutritional status of preschool children and have showed a high rate of malnutrition (Purohit, 2017). Government of India initiated the Integrated Child Development Service (ICDS) scheme on 2nd October 1975 under national nutritional policy to reduce the malnutrition and break the vicious cycle of morbidity and mortality among below six years children and now it has become world's largest programme for early and proper childhood growth and development (Joseph, 2014). ICDS service

provides a huge network of ICDS centers, known as "Anganwadi" which is derived from the Hindu word "Angan" (Surwade et al., 2013). The literal meaning of Angan is the courtyards of a house, where children can play, get supplementary food and pre-school education (ICDS Report, 2009).Other than these anganwadi providesimmunization, health check-up, referral services, and health and nutrition education for betterment of children (Sharma et al., 2006). It is a childcare center located within the village and runs by one trained female person called as anganwadi worker (Bhattarai et al., 2017). She is a community based front line voluntary worker of the ICDS programme (Ahmad et al., 2020). Her primary work is to support the family particularly mothers to ensure effective health and nutrition care, early recognition and timely treatment of infirmities (Das et al., 2020). It serves the extreme vulnerable and underprivileged sections of backward and remote areas of the nation and provides services exact at the doorsteps of the beneficiaries to ensure their maximum involvement (Chudasama et al., 2016).Nutrition also improves their ability to learn, communicate, think analytically, socialize effectively and adapt to new environments and people. Growth and development are continuous processes which begin at conception and end at maturity. Poor health of the children alters the nutritional status. This poor nutritional status of the child leads to development of infectious diseases and finally malnutrition which may leads to permanent physical and mental impairment (Sheila et al., 2014). The nutritional status is determined by a complex interaction between internal factors and external factors: internal factors like: age, sex, nutrition, behavior, physical activity and diseases and external environmental factors like: food safety, cultural, social and economic circumstances (Thurstans et al., 2020). The objective of the present study is to assess the impact of Anagnwadi centers (under ICDS) on nutritional status of studied children.

**Material and Methods**

The study is based on cross-sectional method, conducted on 780 children from 50 anganwadi, aged ranged from 2-5 years of Bilaspur, Chhattisgarh India and used simple random technique for data collection. Anthropometric measurements, socio-demographic profile, supplementary food and other basic facilities provided in ICDS Centers have been collected from anganwadi workers. Age of the children was collected from "Jaccha-Baccha" card. Interview schedule has been opted for collecting data. Data has been collected after obtaining the necessary approval from the competent authorities. WHO (2006)classification for Z-Scorehas been used to assess the prevalence of undernutrition among studied children. There mainly three types of undernutrition such as stunting also called as low height-for-age, refers to chronic malnutrition due to insufficient dietary intake which affects the mental and physical development of a child. Second one is underweight, called as low weight-for-age, refers to acute malnutrition, increase the high risk of mortality among children and last one is wasting (BMI-for-age), refers to acute malnutrition and mainly occurs due to infectious disease and poor nutrition (WHO, 2010).According to WHO (1995), when BMI of population is lower than 18.5 $kg/m^2$ it is classified as Low prevalence (5-9%); Medium prevalence (10-19%); High prevalence (20-39%); and Very high prevalence (40%). All statistical analyses have been performed using the Statistical Package for Social Science (SPSS/PC- Version 23) such as percentages, frequency, chi square test, and regression etc. Statistical significance has been set to a value of $p < 0.05$. Microsoft office excel was used for the graphical representation of figures.

The estimated sample size of the studied children has been calculated by the formula:

$n = (z^2pq)/d^2$, (Cochran, 1977)

**Results**

Table 1 shows overall combined age and sex composition of the studied children. Out of 780 children boys constitute 388 (49.7%) and girls constitute 392 (50.2%) respectively. For the age group of 2 years, boys constitute 75 (19.3%) and girls constitute 75 (19.1%) respectively. For the age group of 3 years, boys constitute 99 (25.5%) and girls constitute 90 (23.0%) respectively. For the age group of 4 years, boys

constitute 125 (32.3%) and girls constitute 113 (28.8%) respectively. Similarly, for the age group of 5 years, boys constitute 89 (22.9%) and girls constitute 114 (29.1%) respectively.

**Table 1: Age and sex composition of the studied children**

| Age (Years) | Sex | Frequency | Percent |
|---|---|---|---|
| 2 | Boys | 75 | 19.3 |
| | Girls | 75 | 19.1 |
| 3 | Boys | 99 | 25.5 |
| | Girls | 90 | 23.0 |
| 4 | Boys | 125 | 32.3 |
| | Girls | 113 | 28.8 |
| 5 | Boys | 89 | 22.9 |
| | Girls | 114 | 29.1 |
| Total | | 780 | 100.0 |

Table 2 shows the descriptive statistics and mean difference in anthropometric variables among the studied children. It is clear from the table that there is significant mean positive sex difference in mean weight (t-value = 0.022; df = 148; p = 0.009), height (t-value = -0.427; df = 148; p = 0.001), and BMI (t-value = 0.512; df = 148; p = 0.051) at the age of 2 years. Similarly, there is significant mean positive sex difference in mean weight (t-value = 0.896; df = 187; p = 0.003), height (t-value = -1.592; df = 187; p = 0.050), and BMI (t-value = 0.794; df = 187; p = 0.012) at the age of 3 years.

**Table 2: Descriptive statistics and mean difference in anthropometric variables among the studied children**

| Age | Sex | Weight (kg) | | Height (cm) | | BMI (kg/m$^2$) | |
|---|---|---|---|---|---|---|---|
| | | M | SD | M | SD | M | SD |
| | Boys (75) | 9.57 | 0.93 | 81.13 | 3.86 | 14.5 | 1.36 |
| | Girls (75) | 9.45 | 1.25 | 81.48 | 5.60 | 14.4 | 1.63 |
| 2 | T-Test | 0.022* | | -0.427* | | 0.512* | |
| | Boys (99) | 10.87 | 1.13 | 85.77 | 4.47 | 14.76 | 1.17 |
| | Girls (90) | 11.04 | 1.49 | 86.89 | 5.22 | 14.6 | 1.47 |
| 3 | T-Test | 0.896*; df=187; 0.003 | | -1.592*; df=187; 0.050 | | 0.794*; df=187; 0.012 | |
| | Boys(125) | 12.98 | 1.65 | 94.35 | 6.23 | 14.5 | 1.26 |
| | Girls(113) | 12.61 | 1.65 | 94.50 | 5.85 | 14.1 | 1.54 |
| 4 | T-Test | 1.743 | | -0.187 | | 2.429 | |
| | Boys (89) | 14.46 | 1.967 | 100.01 | 6.89 | 14.47 | 1.55 |
| | Girls(114) | 14.26 | 1.773 | 100.10 | 6.78 | 14.28 | 1.80 |
| 5 | T-Test | 0.765 | | -0.090 | | 0.776 | |

Significance At *=P<0.05, **=P<0.01, ***=P<0.001

Table 3 shows the age and Sex Specific prevalence of Stunting, underweight, wasting and their relationship among studied children. Overall out of 780 children total 48.7% children have been found stunted. Highest prevalence of stunting has been found among the 3 years of boys (35.3%) and girls (25.5%) and least prevalence has been found for 2 years of boys (14.6%) and girls (12.0%). Similarly, moderately stunting has been found highest for the 2 years of boys (41.3%) and 4 years of girls (30.7%) and least prevalence has been found highest for 3 years of boys (28.8%) and girls (13.3%). It has been clear from the above table that there

is significant relationship between boys and girls at age 3 years ($x^2$ = 12.352; df=2; p = 0.002) and 4 years ($x^2$ = 4.381; df=2; p = 0.021) with respects to their height-for-age.

**Table 3: Age and Sex Specific Prevalence of height-for-age, weight-for-age, BMI-for-age and their relationship among studied children**

| Age (Years) | Sex (N) | Height-For-Age | | | | | | Chi Square ($X^2$) |
|---|---|---|---|---|---|---|---|---|
| | | Severely Stunted | | Moderately Stunted | | Normal | | |
| | | N | % | N | % | N | % | |
| 2 | Boys (75) | 11 | 14.6 | 31 | 41.3 | 34 | 45.3 | 2.580 |
| | Girls (75) | 09 | 12.0 | 22 | 29.3 | 43 | 57.3 | |
| 3 | Boys (99) | 35 | 35.3 | 28 | 28.8 | 36 | 36.3 | 12.352** |
| | Girls (90) | 23 | 25.5 | 12 | 13.3 | 55 | 61.1 | |
| 4 | Boys (125) | 31 | 24.8 | 32 | 25.6 | 62 | 49.6 | 4.381** |
| | Girls (113) | 18 | 15.9 | 35 | 30.7 | 60 | 53.0 | |
| 5 | Boys (89) | 19 | 21.3 | 29 | 32.3 | 41 | 46.0 | 2.466 |
| | Girls (114) | 16 | 14.0 | 29 | 25.4 | 69 | 60.5 | |
| Age (Years) | Sex (N) | Weight-For-Age | | | | | | Chi Square ($X^2$) |
| | | Severely Underweight | | Moderately Underweight | | Normal | | |
| | | N | % | N | % | N | % | |
| 2 | Boys (75) | 13 | 17.3 | 29 | 38.6 | 33 | 44 | 2.736 |
| | Girls (75) | 8 | 10.6 | 26 | 34.6 | 41 | 54.6 | |
| 3 | Boys (99) | 21 | 21.2 | 50 | 50.5 | 28 | 28.8 | 6.185* |
| | Girls (90) | 10 | 11.1 | 41 | 45.5 | 39 | 43.3 | |
| 4 | Boys (125) | 15 | 12.0 | 31 | 24.8 | 79 | 63.3 | 0.594 |
| | Girls (113) | 19 | 16.8 | 32 | 28.3 | 66 | 58.4 | |
| 5 | Boys (89) | 10 | 11.3 | 23 | 25.8 | 56 | 62.9 | 7.892 |
| | Girls (114) | 09 | 7.8 | 27 | 23.6 | 78 | 67.5 | |
| Age (Years) | Sex (N) | BMI-for-age | | | | | | Chi Square ($X^2$) |
| | | Severely Wasted | | Moderately Wasted | | Normal | | Over Weight | |
| | | N | % | N | % | N | % | N | % | |
| 2 | Boys (75) | 13 | 17.3 | 29 | 38.6 | 32 | 41.3 | 1 | 1.3 | 14.056* |
| | Girls (75) | 10 | 13.3 | 27 | 36.0 | 33 | 44.0 | 5 | 6.6 | |
| 3 | Boys (99) | 19 | 21.2 | 31 | 31.3 | 43 | 43.3 | 4 | 4.0 | 23.328* |
| | Girls (90) | 4 | 4.4 | 14 | 15.5 | 64 | 71.1 | 8 | 8.8 | |
| 4 | Boys (125) | 12 | 9.6 | 14 | 11.2 | 92 | 73.7 | 7 | 5.6 | 10.102* |
| | Girls (113) | 5 | 4.4 | 6 | 5.3 | 97 | 85.6 | 5 | 4.2 | |
| 5 | Boys (89) | 7 | 7.8 | 7 | 7.8 | 69 | 77.5 | 6 | 6.7 | 7.169 |
| | Girls (114) | 4 | 3.5 | 20 | 17.5 | 86 | 75.6 | 4 | 3.5 | |

Significance At *=P<0.05, **=P<0.01, ***=P<0.001.

In case of underweight, out of 780 children total 46.3% children have been found underweight. It has been observed that severely underweight has been found highest at the age of 3 years of boys (21.2%) and 4 years of girls (16.8%) and lowest has been found at the age of 4 years of boys (12.0%) and 5 years of girls (7.8%). Similarly, the moderately underweight has been observed highest among at the age of 3 years of boys

(50.5%) and girls (45.5%) and the lowest prevalence has been found 4 years of boys (24.8%) and 5 years of girls (23.6%). It has been clear from the above table that there is significant relationship between boys and girls at age 3 ($x^2$ = 6.185; df=2; p=0.045) years with respects to their weight-for-age. For wasting it has been found that out of 780 children total 28.8% children have been found wasted. It shows that 3 years of boys (21.2%) and 2 years of girls (13.3%) have been found more likely to be severely wasted and at the age of 5 years of boys (7.8%) and girls (3.5%) had less likely to be wasted. Similarly, the highest prevalence of moderately wasting have been observed at the age of 2 years of boys (38.6%) and girls (36.0%) and the lowest have been found at the age of 5 years of boys (7.8%) and 4 years of girls (5.3%). The prevalence of overweight has been found highest at the age of 5 years (6.7%) and 3 years of girls (8.8%) and lowest prevalence has been found at the age of 2 years of boys (1.3%) and 5 years of girls (3.5%) respectively. It has been clear from the above table that there is significant relationship between boys and girls at age of 2 years ($x^2$ = 14.056; df=5; p=0.026), 3 years ($x^2$= 23.328; df=4; p = 0.000), and 4 years (10.102; df=2; 0.034) with respects to their BMI-for-age. Table 4 shows the relationship of receiving supplementary food by ICDS children with weight-for-age, height-forge and BMI-for-age among the studied children. It has been found highest among those children who are not receiving regularly supplementary food than those children who are receiving food regularly. Those children who are not receiving regularly supplementary food have been found severely stunted (32.1%) than moderately stunted (23.9%). Similar study has been conducted in Aligarh ICDS children and found 68% of the children found to be stunted who are not taking regularly food (Alim and Jahan, 2012). Dropout of children due to irregular opening of ICDS center, helper don't come to home daily, it is far from home, unwillingness of children. Approx. 20.7% of the children have been found underweight due to not taking regularly supplementary food. Around 16.4% and 19.6% of the children have been found severely and moderately wasted. Most of the parents are engaged as wage labor or cultivators, so children also use to be with them all the time instead of attending anganwadi. It is clear from the table that there is a significant relationship between receiving supplementary food by ICDS children with that of height-for-age (17.57; df=2; 0.01), weight-for-age (20.98; 22.963; df-2; 0.000), and BMI-for-age (27.90; df=5; 0.000) respectively.

**Table 4: Relationship of receiving supplementary food by ICDS children with weight-for-age, height-forge and BMI-for-age among the studied children**

| Category | Height-For-Age | | | | | | Chi Square |
|---|---|---|---|---|---|---|---|
| | Severe Stunting N % | | Moderate Stunting N % | | Normal N % | | |
| Yes | 100 | 19.0 | 170 | 32.3 | 255 | 48.5 | 17.57* |
| Not Regularly | 82 | 32.1 | 61 | 23.9 | 112 | 43.9 | |
| Category | Weight-For-Age | | | | | | Chi Square |
| | Severe Underweight N % | | Moderate Underweight N % | | Normal N % | | |
| Yes | 48 | 9.1 | 217 | 41.3 | 260 | 49.5 | 20.98** |
| Not Regularly | 53 | 20.7 | 97 | 38.0 | 105 | 41.1 | |
| | BMI-For Age | | | | | | |
| Category | Severe Wasting N % | | Moderate Wasting N % | | Normal N % | | Overweight N % | | Obese N % | | Fischer Exact |
| Yes | 41 | 7.8 | 63 | 12.0 | 391 | 74.4 | 29 | 5.5 | 1 | 0.1 | 27.903*** |
| Not Regularly | 42 | 16.4 | 50 | 19.6 | 152 | 59.6 | 10 | 3.9 | 1 | 0.3 | |

Significance at *=P<0.05, **=P<0.01, ***=P<0.001

Table 5 deals with the linear regression analysis with age (as an independent variable) to record the impact of age on anthropometric and derived (dependent) variables recorded separately. The dependent variables are weight, height. And it had been clear from table that age had a significant impact on used anthropometric measurements. Height (dependent variable) showed the highest significance and adjusted $R^2$ indicates the variance to be 58.7% followed by weight (dependent variable) adjusted $R^2$ indicates the variance of 55.7%. It is clear from the table that for both height and weight the p value is 0.000 which is less than 0.05; hence, it shows that there is significant association between independent and dependent variable.

**Table 5: Regression Analysis: Impact of Age (Independent Variable) on anthropometric measurements among the studied children**

| Dependent variable | B | SEB | Beta | t | Sig. | Adjusted $R^2$ |
|---|---|---|---|---|---|---|
| Weight | 6.229 | 0.197 | 0.747 | 31.654 | 0.000 | 0.557 |
| Height | 67.843 | 0.739 | 0.766 | 91.849 | 0.000 | 0.587 |

Where, refers to regression coefficient. SEB refers to standard error of B.
Beta refers to estimated regression coefficient. Sig. means level of significance.

Table 6 shows the association of socio-demographic predictors for height-for-age by stepwise binary logistic regression. It is clear from the table that out of the total 12 variables used to see the association between height for age and above mentioned variables, five variables such as sex (p = 0.000), Mother's education (p = 0.026), Number of siblings (p = 0.009), Birth order (p = 0.000) and Breastfed (p = 0.054) shows significant relationship with height-for-age among the studied children.

**Table 6: Association of socio-demographic predictors for height-for-age by stepwise binary logistic regression**

| | Variables | Score | | df | | Sig. | |
|---|---|---|---|---|---|---|---|
| Step 0 | Sex | 12.416 | | 1 | | 0.000 | |
| | Fathers Education | 4.822 | | 1 | | 0.028 | |
| | Mothers Education | 6.040 | | 1 | | 0.014 | |
| | Fathers occupation | 0.419 | | 1 | | 0.517 | |
| | Mothers occupation | 2.410 | | 1 | | 0.121 | |
| | Family income | 0.327 | | 1 | | 0.567 | |
| | Socio-economic status | 2.216 | | 1 | | 0.137 | |
| | Delivery place | 0.000 | | 1 | | 0.997 | |
| | Number of siblings | 0.819 | | 1 | | 0.366 | |
| | Birth order | 6.419 | | 1 | | 0.011 | |
| | Breastfed | 3.706 | | 1 | | 0.054 | |
| Overall Statistics | | 40.151 | | 11 | | 0.000 | |
| | Variable | B | S.E. | Wald | df | Sig. | Exp(B) |
| Step 7[a] | Sex | 0.539 | 0.148 | 13.255 | 1 | 0.000 | 1.714 |
| | Mothers Education | 0.171 | 0.077 | 4.986 | 1 | 0.026 | 1.187 |
| | Number of siblings | 0.267 | 0.103 | 6.788 | 1 | 0.009 | 1.306 |
| | Birth order | -0.327 | 0.093 | 12.328 | 1 | 0.000 | 0.721 |
| | Breastfed | -0.350 | 0.189 | 3.439 | 1 | 0.054 | 0.704 |
| | Constant | -0.789 | 0.419 | 3.540 | 1 | 0.060 | 0.454 |

Table 7 shows the association of socio-demographic predictors for weight-for-age by stepwise binary logistic regression. It is clear from the table that out of the total 11 variables used to see the association between weight for age and above mentioned variables, only eight variables such as sex (p = 0.011), father's education (p = 0.000), father's occupation (p = 0.000), family income (p = 0.040), socio-economic status (p = 0.002), number of siblings (p = 0.000), birth order (p = 0.000), and breastfed (p = 0.000), shows significant association with weight-for-age among the studied children.

**Table 7: Association of socio-demographic predictors for weight-for-age by stepwise binary logistic regression**

| | | | Score | df | Sig. |
|---|---|---|---|---|---|
| Step 0 | Variables | Sex | 6.354 | 1 | 0.012 |
| | | Fathers Education | 17.382 | 1 | 0.000 |
| | | Mothers Education | 3.197 | 1 | 0.074 |
| | | Fathers Occupation | 13.763 | 1 | 0.000 |
| | | Mothers occupation | 0.007 | 1 | 0.934 |
| | | Family Income | 2.836 | 1 | 0.092 |
| | | Socio-economic status | 12.730 | 1 | 0.000 |
| | | Delivery Place | 0.071 | 1 | 0.790 |
| | | Number Of Siblings | 2.312 | 1 | 0.128 |
| | | Birth order | 14.462 | 1 | 0.000 |
| | | Breastfed | 36.525 | 1 | 0.000 |
| | Overall Statistics | | 105.386 | 11 | 0.000 |

| | | B | S.E. | Wald | df | Sig. | Exp(B) |
|---|---|---|---|---|---|---|---|
| Step 4[a] | Sex | 0.398 | 0.156 | 6.528 | 1 | 0.011 | 1.489 |
| | Fathers Education | 0.623 | 0.139 | 20.200 | 1 | 0.000 | 1.864 |
| | Fathers occupation | 0.739 | 0.191 | 14.993 | 1 | 0.000 | 2.094 |
| | Family Income | 0.415 | 0.202 | 4.230 | 1 | 0.040 | 1.514 |
| | Socio-economic status | -0.276 | 0.088 | 9.767 | 1 | 0.002 | 0.759 |
| | Number of siblings | 0.432 | 0.111 | 15.019 | 1 | 0.000 | 1.540 |
| | Birth order | -0.474 | 0.101 | 21.872 | 1 | 0.000 | 0.623 |
| | Breastfed | -1.337 | 0.216 | 38.403 | 1 | 0.000 | 0.263 |
| | Constant | -0.957 | 0.534 | 3.219 | 1 | 0.073 | 0.384 |

**Discussion**

Near about 66.0% of the anganwadi centers had separate buildings followed by rental (20.0%) than running anganwadi at workers home (14.0%). It shows they need separate buildings with all basic facilities such as room for children seating, store room for keeping all food items, kitchen and toilet. For rent, anganwadi workers get only 200rs. per month from the government and actual they pay more than 500 per month for rent to run their centers. They complained it is very difficult to run anganwadi centers on rent or at home due to lack of space for seating, playing and eating altogether at a time. Almost 78.0% of the anganwadi center had pucca buildings while 22.0% of the anganwadi centers had kaccha buildings. Thirty six anganwadi centers have been found opened for four hours, followed by twelve anganwadi centers opened for five hours. It has been observed that 90.0% of the anganwadi centers open for 5-6 days in a week while 10% of the anganwadi centers open for 3-4 days in a week. Most of the children (67.0%) have been found attending anganwadi

regularly while 32.7% of the children have been not found attending regular anganwadi. It has been observed that 28.0% of the anganwadi centers have been found with not cooking food daily as per menu, while 72.0% of the anganwadi centers have been found with cooking food as per menu. The reason behind it was observed the delay supply of raw food from Self Help Group.Some of the centers have been observed with lack of kitchen space.

The present study shows that near about 66.0% of the anganwadi workers have been found having correct knowledge of using weighing machine while 34.0% of the anganwadi workers had incorrect knowledge because either they do not check the zero error in weighing machine or not acquainted with using of digital weighing machine properly. It has been observed that in 74.0% of the anganwadi centers had weighing machine in functional condition while 26.0% of the anganwadi centers have been found with non-functional. Due to battery issues or damaging of weighing machine they were not able to regular growth monitoring. Only 54.0% of angawadi centers have been found weighing children every month while rest of the centers had been found weighing children in every 3 months. The recommended calorie is 635 kcal/per meal/per child, so approx. 47.0% of the anganwadi workers have been found with correct knowledge of providing supplementary nutrition in calorie per day while 26% of the anganwadi workers were unaware. Another study conducted among Telangana children, found that 26% of the workers were unaware about supplementary nutrition (Harikrishna et al., 2020).

Most of the anganwadi workers had correct knowledge of different colors (red, yellow and green) present in MUAC strip while 16.0% of the anganwadi workers had not correct knowledge. All anganwadi centers get WHO (2006) recommended growth chart for assessing the health status of children, 80.0% of the anganwadi workers have been found with correct knowledge of growth chart reading where as 20% of the workers have been found with incorrect knowledge, and they used to take help of other anganwadi workers to fill it. The main reason that was pointed out was the lack of skills among Anganwadi workers in filling up growth charts. Similar kind of result has been observed in the study of Bhattarai et al., (2017), found that 21.8% and 21.1% of the anganwadi worker had incorrect knowledge of colors present in MUAC Strip, and the flattened growth line on growth chart.

All anganwadi centers are expected to have drinking water facility but it has been observed that only 68.0% of the anganwadi centers had drinking facilities in anganwadi centers while 32.0% anganwadi do not have. Except for sevenanaganwadi centers, rest of centers had not water filter in their centers. Angawadi helper used to go to another place for fetching the drinking water for cooking and drinking for the children. For toilet facility it has been found that 72% of the anganwadi centers had toilet in their centers while 28% of centers do not have this facility. And out of 72% centers, only 44% of the anganwadi have been found toilet in working condition while 56% of the centers have been found toilet in non-working condition and practicing open defecation that may lead to have infectious diseases. For availability of mat or chair, 88% of the centers had mat for seating while only 12% of the anganwadi centers hadbenches for children in centers. Every month all mothers are called to anganwadi centers to tell about nutritional health education but due to engaged in wage labor or in cultivation they are not able to go, this is one of the reason that they do not have knowledge regarding this. Half of the mothers had partial knowledge of anaganwadi services like distribution of foods while only 33.8% of the women had knowledge of all services provided by anaganwadi centers like preschool education, vaccination, and supplementary food. It has been found that 66.9% of the mothers were satisfied with working pattern of anganwadi workers like regular opening of angwanwadi centers, food quality and care taking of children whereas 33.1% of the mothers were not satisfied with working pattern of anganwadi workers. Poor rapport establishment of worker with mothers and children also can be significant factor for the occurrence of undernutrition. Many times AWW don't get enoughtime to spend full time with children due to engaged in other works such as surveys, polio camping, census work, election work, or some other work related to village and also they have to prepare at least 22 registers for maintaining all records.Since the honorarium was not satisfactory, it results into their effectiveness and efficiency in performing the duties.

**Conclusion**

Present study shows the overall the prevalence of stunting, underweight and wasting are 48.7%, 46.3% and 28.8% respectively. It shows the critical situation of undernutriton among studied children. Nutrition surveillance should be done continuously and special attention should be given to vulnerable groups such as poorest and the most severely malnourished children. Even after supplement of nutrients to the preschooler is anganwadis, need based diet to be provided to the critical children then severe one. Proper training should be given to the supervisor and ICDS worker for proper care and minority. Efforts should be taken to supply food with better quality and variety. More attention should be given for prompt medical care in case of reaction after immunization, monitoring of children/women for completing immunization course and follow-up of immunization.

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