

Factors Associated with Percent Immunization Coverage among Children Aged 12-23 Month in Somalia

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Abstract: Global vaccination coverage – the proportion of the world’s children who receive recommended vaccines – has remained the same over the past few years. This work aimed at determining the factors associated with complete immunization coverage among children aged 12-23 month in Somalia. The study was a descriptive cross-sectional study conducted in Galkayo hospital. Systematic random sampling probability technique was carried out in Galkayo hospitals to recruit 357 women. Well-structured questionnaires were filled by participants who gave their consent. Data were analyzed using the statistical package for social sciences version 21. Descriptive data were generated and statistical inferences tested using the chi-square method with the level of significance set at 5%. Result displayed that the age of the respondents was between 12-24 month with a mean age of 7.71±5.87. The level of education of the mother, ($p = 0.0001$), the Place of Delivery of the baby, ($p = 0.0001$) and the Distance of the participants to health facility ($p = 0.026533$) affected the immunization coverage percentage. The full immunization coverage in Somalia was 20%. Conclusion: the study is recommended to the government to increase the level of education of the mother, increase the hospital delivery recommended the government and the NGOs works in Somalia, to expand the program of immunization.

Key words: Immunization Coverage • Children Between 12-24 Month • Galkayo Somalia • Galkayo University

INTRODUCTION

Global vaccination coverage - the proportion of the world’s children who receive recommended vaccines - has remained the same over the past few years. During 2017, about 85% of infants worldwide (116.2 million infants) received 3 doses of diphtheria-tetanus-pertussis (DTP3) vaccine, protecting them against infectious diseases that can cause serious illness and disability or be fatal. By 2017, 123 countries had reached at least 90% coverage of DTP3 vaccine [1].

The Expanded Programme on Immunization (EPI) seeks to reduce morbidity and mortality by providing immunization against diphtheria, pertussis, tetanus, measles, poliomyelitis and tuberculosis for all children of the world by 1990. The special concern of EPI is the strengthening of immunization services for children in

developing countries and the programme seeks methods of programme implementation and evaluation that are effective, simple and inexpensive.

An example of such a method is the estimation of immunization coverage through the examination of approximately 210 children, selected randomly as 30 groups of 7 children each. This is based on a survey technique originally used in the United States of America and later updated for use in West Africa [2].

There is research indicating that At 24 months of age 42% of Latin children and 26% of African were immunized [3].

In developed countries, measles immunization programmes have reduced the number of cases reported annually to negligible proportions [4]. However, measles still remains a major health problem in sub-Saharan Africa, especially in urban areas with high population densities.

In Zimbabwe, measles is endemic with transmission peaks between August and December, despite the high levels of measles immunization coverage achieved in recent years [5].

In Pakistan, the research has found that EPI despite 20 years of struggle, could not establish an organized information/motivation programme for crowds and to educate them on the importance of child immunization. Moreover, a doubt in the mind of mothers about the non-availability of vaccine or absence of vaccinator at the place of immunization was also an important factor in the failure of the immunization programme. All this shows the inefficiency of the programme and requires a serious thought by the EPI department. The other important aspect revealed that the researcher was parents/caretakers perception regarding the importance of the immunization card. He found only 36% of mothers could produce the immunization card in support of their child's immunization status. This showed that the immunization card was not considered an important document [6]. Also, The Immunization coverage in India is far from complete with a disproportionately large number of rural children not being immunized [7].

In the past decade the vaccination coverage has been improved in Ethiopia, the incidence of measles has increased from 3.19/100, 000 in 2009 to 7.35/100, 000 in 2010 [The Ethiopian Demographic and Health Survey (DHS) 2005 revealed that only 20% of children 12-23 months of age were fully vaccinated and 24% of children did not receive any vaccination Children were more likely to be vaccinated the first doses of vaccination than the third and the fourth doses in which 60% of children received BCG and from this only 35 % of them received measles vaccine [8].

Mukungwa [9] found out that birth order was an important predictor of full immunization in Zimbabwe. This is likely so because for the lower birth order children, mothers are enthusiastic about having children and they exert appropriate care and upbringing of the children.

WHO and health partners support immunization activities in approximately 200 fixed centres and outreach vaccination sites across the country. WHO has established and provided support to immunization units within ministries of health and is instrumental in supervising and coordinating immunization activities in the northern regions of Somalia. WHO continues to train health workers, improve cold chain and support supervisory and monitoring activities [10].

The researches done in Zimbabwe were found that full vaccination among children aged 12-23 months in Zimbabwe is determined by the region of residence,

wealth status, birth order, place of delivery, antenatal care during pregnancy and exposure to television are significant [9].

In general, the immunisation coverage in Somalia is unknown except some reports from WHO or UNICEF, these organisations have estimated immunisation coverage in Somalia. Also, immunisation plays an important role in reducing child mortality and morbidity. Children of the urban poor suffer accentuated vulnerability to illnesses, as outbreaks of vaccine-preventable diseases are more common in urban.

Vaccine-preventable diseases are prevalent in Somalia and child mortality is 200 per 1000 live births. Measles is estimated to be the leading cause of death in children under the age of five (WHO, 2016).

Despite this, only 30-40% of children are immunized against the six major childhood diseases. This is relatively low compared to the global coverage of almost 80%. Routine child immunization coverage among one-year-old children for measles is 24% and for Diphtheria, tetanus and pertussis (DTP3) is 31% [11].

Control of vaccine-preventable diseases remains a huge challenge in Somalia, due to the low routine immunization coverage and the continued inability to reach almost 600 000 under-five children with supplementary immunization activities. The polio outbreak that hit Somalia in May 2013 is a strong reminder of the risks posed by a large cohort of un-immunized children, as of the end of February, the total number of polio cases in Somalia stands at 194. The two most recent cases had the onset of paralysis on 20 December 2013 and were reported in Somalia [12].

The determinant of this issue is unknown in Somalia that is why they mostly happen in a large area in Somalia.

Despite the report from the WHO or UNICEF there is no single research that have been done in this issue for factors determined by the immunization coverage of children less 2 years in Galkayo Somalia, but there is only a few researchers done in Somalis in Ethiopian region that indicated low coverage immunization of children less than 2 years, thus this study will focus on the immunization coverage of children less than 2 year. In general, the immunization coverage in Somalia is unknown except some reports from WHO or UNICEF, these organization have estimate immunization coverage in Somalia. The study will form a basis for future discussions and research in the area of vaccination to facilitate the adoption of better strategies to improve access and to know how many have got the immunization to exist in Galkayo Somalia. This study was based on to answer the following question.

- What are the determinants of immunization coverage among 12- 23 months children in south Galkayo district?
- What is the Percent of immunization coverage among 12- 23 months children in south Galkayo district?.

$$n = \frac{(1.96)^2 \cdot 0.36.6 \times 0.63.4}{(0.05)^2} = 357$$

MATERIALS AND METHODS

Study Site: This study was conducted in Galkayo public hospital, mudug Galkayo Somalia. Somalia is a country located in the Horn of Africa. It is bordered by Ethiopia to the west, Djibouti to the northwest, the Gulf of Aden to the north, the Indian Ocean to the east and Kenya to the southwest.

Galkayo Hospital was began his building at the end of 1999 by community members, business persons, diasporas and intellectuals. This building was organized by Mudug Development Organization (MDO). The hospital began its work in April 2000 for emergency and OPD consultation and Inpatient departments.

The number of the children who visited hospital per months is 6000 according data the researcher got in 2018.

Study Design: The design of study will be a descriptive, cross-sectional study to investigate assessment factors associated with complete immunization coverage among children in aged 12-23month in Galkayo public hospital.

Inclusion/Exclusion Criteria: This was only focused the children 12 to 23 months age group who visited at Galkayo public hospital. Also was excluded if they had poor caretaker who can't give information of his/her child. And those who denied to participate our research.

Sample Size Determination: The sample size was calculated using the formula of $\frac{(z\alpha)^2 p \times q}{(d)^2}$ [Leslie kish

Formula], with 36.6% of prevalence found the research conducted the Somalis region in ethiopian [13].

where;

n = the desired sample size

Z α = standard normal deviate at 95% confidence limit = 1.96'

p = maximum variability of the population

q = the difference between 1 and p

d = is the desired level of precision (i.e. the margin of error)

finally it was founded =

Systematic random sampling probability technique will be carried out in hospitals to conduct the study. First the start number/ Sampling interval (K) that was 16 was calculated from the children visited at Galkayo hospital, then was chosed the start number by loitry methods and the start number was 5 then was continued this interval until the desired number was achieved.

$$K : \frac{6000}{357} = 16$$

Data Collection Procedure: The study used a well-structured questionnaire which was drafted from literature. The objectives of the study were well explained to take care and those who agreed and gave written consent were made to fill the questionnaire. The question were admistrative administer, so the rersearcher was filling out of the questionnairesfrom the participants. Because Galkayo hospital has three work shifts for medical personnel- morning, afternoon and night, the collection of data was planned during the morning shift where the most OPD patients come to the hospital.Data collection spanned between the period of may- 2019 to june 2019.

Data Analysis: Collected Data were verified, coded and summarised before they were analysed using the IBM SPSS version 20.0 computer software. Descriptive statistics of frequencies, percentages, mean and standard deviations were generated. Statistical inferences were tested using the chi-square method with a level of significance set at p< 0.05.

Ethical Consideration: The study was thought about the ethical issues throughout research and will kept the privacy and confidentiality of the respondents from the hospital. Every respondent was asked for permission to complete the questionnaire. The ethical approval will be getting from Galkayo University and administrative of Galkayo Hospital.

RESULTS

Table 1 shows the socio-demographic characteristics of the participants. The age range of the children in the study was 12-24 month with mean of 17.21 \pm 3.72. The majority (73.7%) of the mothers in the study have non-formal education level, also the mojirity of them was

Table 1: Socio-demographic Characteristics of the Participants (n=357)

| Variable | Frequency | Percentage |
|----------------------|-----------|------------|
| 1. Age (Month) | | |
| 12-14 | 111 | 31.1 |
| 15-19 | 137 | 38.4 |
| 20-24 | 109 | 30.5 |
| 2. Education | | |
| Non-formal | 263 | 73.7 |
| Primary | 66 | 18.5 |
| Secondary | 17 | 4.8 |
| ertiary | 11 | 3.0 |
| 3. Marital status | | |
| Widowed | 43 | 12.0 |
| Married | 277 | 77.6 |
| Divorced | 37 | 10.4 |
| 4. Occupation: | | |
| Employed | 80 | 22.4 |
| Non-employed | 277 | 77.6 |
| 5. Family income: | | |
| 50-100 | 72 | 20.2 |
| 110-150 | 55 | 15.4 |
| 160-210 | 89 | 24.9 |
| 220-600 | 141 | 39.5 |
| 6. Residence | | |
| Hormar | 111 | 31.1 |
| Howl/Wadag Wadajir | 48 | 13.4 |
| Garsor | 94 | 26.3 |
| Rural | 72 | 20.2 |
| 7. ANC attended time | | |
| No visits | 191 | 53.5 |
| Less than 4 | 128 | 35.9 |
| 4 and above | 38 | 10.6 |
| 8. Sex of Child | | |
| Male | 145 | 40.6 |
| Female | 212 | 59.4 |
| 9. Birth order | | |
| 1-4 | 199 | 55.7 |
| 5-8 | 112 | 31.4 |
| 9-15 | 46 | 12.9 |

married and non employed status. the family income of the majority of the participnats was between, 160-210 and 220-600. The majority 31.1% of the participants were living in Howl/Wadag, most of the respondant 53.5%. reported that they have not visit ANC during their preganancy of this child. the majority them have one to four child and finally most of them has feamile child.

Immunization Coverage in Somalia: Fig. 1 is showing the immunization coverage in somalia over the 357 participants we interviewed and it was found that 150(42%) of them had taken Bacillus calmette Guerin vaccine (BCG vaccine), Oral polio vaccine (OPV) status of

the participants was 140(39%) have taken OPV 0, 120(33%) have taken OPV 1, 90(25%) have taken OPV 2 and finally 80(22%) had taken OPV 3. Hepatitis B vaccine (HBV) status of the participant was; 120 (33%) of them had taken HBV 1, 110 (30%) had taken HBV2 and 80(22%) of them had taken HBV3. the diphtheria, pertussis and Tetanus status of the participant were found that 115 (32%) had taken DPT1, 80(22%) have taken DPT2 and 100 (28%) of them have taken DPT3. Fig. shows the measles vaccine of the participants as 120(33%) of them have taken measles vaccine. the final the figure is showing that 70 of them were fully immunized over 357 of the participants, that makes 20% of immunization coverage.

Table 2: Factors Associated with the Immunisation Coverage in Somalia. Edit with Times New Roman

| Age of the child (Month) | The full immunization | | Total | P-value |
|--|-----------------------|-----|-------|------------|
| | Yes | No | | |
| 12-14 | 26 | 158 | 184 | .14700000 |
| 15-19 | 26 | 59 | 85 | |
| 20-24 | 18 | 70 | 88 | |
| Total | 70 | 287 | 357 | |
| OccupationOf the mother | | | | 00.134094 |
| Employed | 11 | 69 | 80 | |
| Non-employed | 59 | 218 | 277 | |
| Total | 70 | 287 | 357 | |
| Distance to health facility | | | | 0.026533* |
| Below 1 km | 10 | 58 | 68 | |
| 1-2 km | 31 | 71 | 102 | |
| 2.1-5 km | 18 | 91 | 109 | |
| 5.1-10 km | 6 | 30 | 36 | |
| More than>10 | 5 | 37 | 42 | |
| Total | 70 | 287 | 357 | |
| Sex of Child | | | | 0.351655 |
| Male | 25 | 120 | 145 | |
| Female | 45 | 167 | 212. | |
| Total | 70 | 287 | 357 | |
| Marital status of the mother | | | | 0.707352 |
| Married | 52 | 225 | 277 | |
| Divorce | 9 | 28 | 37 | |
| Windowed | 9 | 34 | 43 | |
| Total | 70 | 287 | 357 | |
| Antenatal care for the mother | | | | 0.456024 |
| No visits | 38 | 153 | 191 | |
| Less than 4 | 22 | 106 | 128 | |
| 4 and above | 10 | 28 | 38 | |
| Total | 70 | 287 | 357 | |
| Level of education of the mother. | | | | 0.000001** |
| Non formal | 35 | 228 | 263 | |
| Primary | 16 | 50 | 66 | |
| Secondary | 11 | 6 | 17 | |
| Tertiary | 8 | 3 | 11 | |
| Total | 70 | 287 | 357 | |
| Place of Residence of the participants | | | | 0.091344 |
| Hormar | 9 | 23 | 32 | |
| Howl/Wadag | 18 | 93 | 121 | |
| Wadajir | 11 | 37 | 48 | |
| Garsor | 24 | 70 | 94 | |
| Rural | 8 | 64 | 72 | |
| Total | 70 | 287 | 357 | |
| Place of Delivery of the baby | | | | 0.000001** |
| Home | 10 | 162 | 172 | |
| Hospital | 60 | 125 | 185 | |
| Total | 70 | 287 | 357 | |
| Birth order of the baby | | | | 0.916631 |
| 1-4 | 40 | 159 | 199 | |
| 5-8 | 22 | 90 | 121 | |
| 9-15 | 8 | 38 | 46 | |
| Total | 70 | 287 | 357 | |

Factors Associated with Immunization Coverage in Somalia: As part of the study objectives, possible factors associated with immunization coverage was determined using the Chi-square. The results are shown in Table 2. Results showed significant association between immunization coverage among the children and the level of education of the mother, ($p = 0.00001$), the Place of Delivery of the baby, ($p = 0.00001$) and

the Distance of the participants to health facility ($p = 0.026533$).

Other factors found not to be significantly associated with immunization coverage were: the Occupation of the mother, Age of the baby, Sex of Child, marital status of the mother, Antenatal care for the mother, Place of Residence of the participants and the Birth order of the baby with $P < 0.05$.

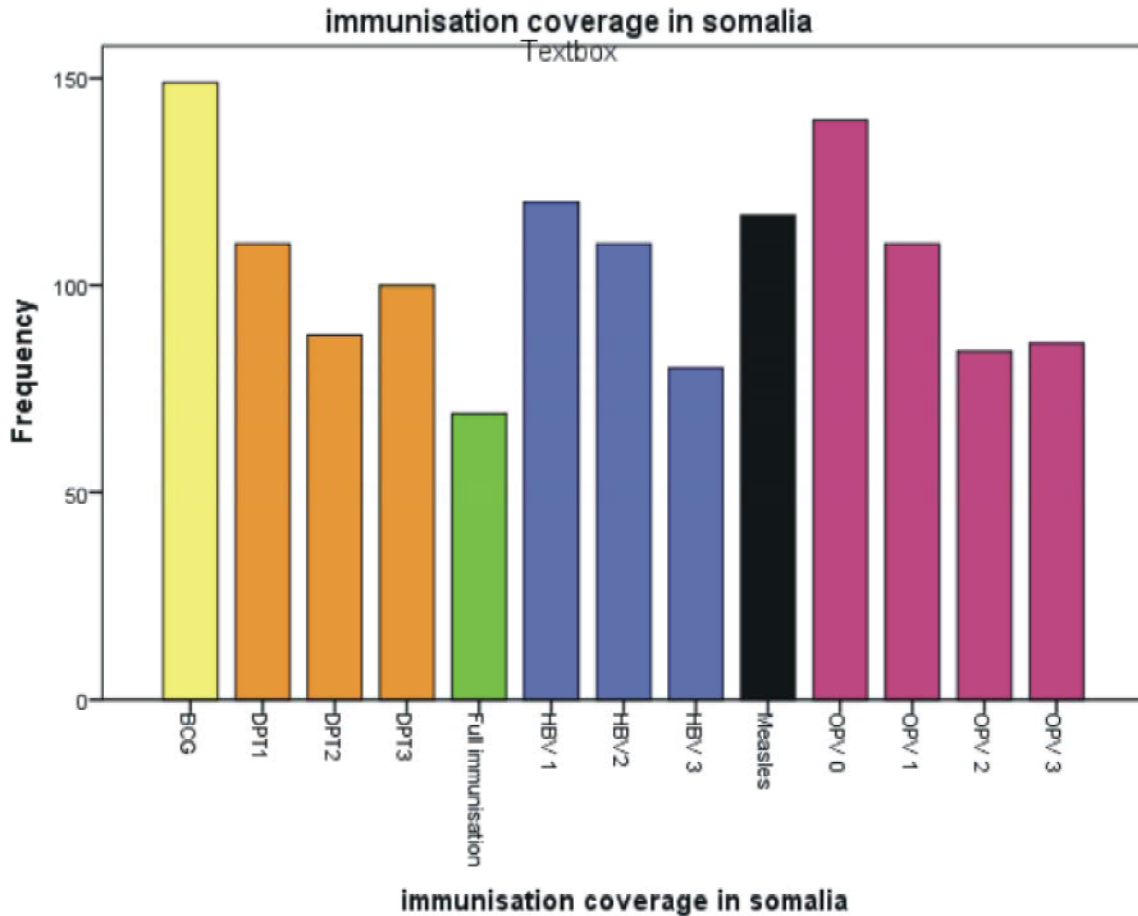


Fig. 1: The Immunisation Coverage of Investigated Children (11-24 month) In Somalia

DISCUSSION

The study focused on the factors associated with complete immunization coverage among children aged 12-23 month in Galkayo public hospital. A cross-sectional survey method was used to recruit participants who are aged 12-23 month and their mothers with currently at OPD service at the study sites.

The study revealed that the the level of education of the mother showed statistical significant association with the full immunization coverage in Somalia. Similar secondary analysis of cross sectional survey data conducted in Sindh province of Pakistan found the similar result [14].

The study also showed that the Place of Delivery of the baby was statistical significant assoiciotion the immunization coverage, that means the babies who were delivered at hospital were most likely to get full immunization coverage while the babies born at home

were less likely to get full immunization coverage. Similar studies [13 &15] conducted in Jigjiga District, Somali National Regional State, Ethiopia and Debre Markos Town, Amhara Regional State, Ethiopia, respectively showed similar results.

Further analysis from the 2016 Ethiopia concerning demographic and health survey found 38.% as full immunization coverage[16] while another study conducted in factors in Jigjiga District, Somali National Regional State, Ethiopia found 36.6% as full immunization coverage [13].

CONCLUSIONS

The study found out that the immunization coverage in Somalia is influenced by the level of education of the mother, the place of delivery of the baby (Home or Hospital) and the Distance of the participants to health facility The full immunization coverage in somalia is 20%.

Recommendation: The study is recommended the government to increase the level of education of the mother, increase the hospital delivery and the NGOs works in Somalia, to expand the program of immunization.

Finally, further studies focusing on assessment factors associated with complete immunization coverage among children in age of 12-23month with different study designs to compare their outcomes is required to help improve the national and regional health of Somalia.

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Competing Interest: The authors declare that they have no competing interest.

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