Care taker's compliance and Associated factors in integrated management of newborn and childhood illness with respect to Counseling in Enebise Sarmidir woreda, West Amhara, Ethiopia.

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Abstract

Background: - The Integrated Management of Newborn and Childhood Illness strategy encompasses a range of interventions to prevent and manage the major childhood illness, both in health facilities and in the home. Information on actual compliance of care takers in integrated management of newborn and childhood illness is important for program planners, policy makers, health care providers and care takers to design appropriate local and national intervention plan, to increase community participation and to improve knowledge of care takers. Based on our knowledge there are limited studies regarding to care takers compliance towards integrated management of new born and childhood illness in the study area. Therefore the result of this study used for design appropriate intervention.

Objective: - The objective of this study was to assess the care takers compliance and associated factors in integrated management of newborn and childhood illness with respect to antibiotic treatment.

Methods:-Community based cross-sectional study was conducted. The study populations were all care takers of under-five children who attended integrated management of newborn and childhood illness clinic at health center. A total of 394 respondents were randomly selected by using systematic random sampling method from the seven health centers. Information on the care takers compliance was collected using structured, pre-tested questionnaire. Data entry and analysis were conducting using Statistical Package for Social Science version 16. Significance of the study was presented by using adjust odd ratio, confidence interval and p value. The result was presented in texts, tables and graphs.

Result:-Three hundred seventy three care takers with under-five year children were voluntary to be interviewed, making the response rate 94.7 %. The findings of this study showed that 144(39%) were compliance to antibiotic treatment. Compliance to antibiotic treatment was significantly associated with post-secondary education with (AOR=5.33, 95%CI: 2.557, 11.109), private/NGO employee with (AOR=5.936, 95%CI: 1.632, 21.582), knowledge with (AOR=1.806, 95%CI: 1.096, 2.976) and distance with (AOR=2.366, 95%CI: 1.419, 3.945). **Conclusion and recommendation:** The finding of this study revealed that the high rates of noncompliance with counseling were identified. Therefore, the implementation of integrated management of childhood illness activities at all levels should be strengthened. There is a great need to improve the social status of care takers in order to reduce child hood morbidity and mortality.

Background

Most of the children who die each year could be saved by evidence-based, cost-effective measures such as [vaccines](#), [antibiotics](#), micronutrient supplementation, insecticide-treated bed nets, improved family care and [breastfeeding](#) practices and [oral rehydration therapy](#). Empowering women, removing financial and social barriers to accessing basic services, developing innovations that make the supply of critical services more available to the poor and increasing local accountability of health systems are policy interventions that have allowed health systems to improve equity and reduce mortality (1).

Major progress has been made to reduce childhood morbidity and mortality in the world, through childhood immunization, diarrhea control, acute respiratory truck infection (ARI) control, nutritional program and through implement action of other primary health care activities. In spite of such intervention under- five morbidity and mortality remain at an acceptably high rate especially in sub-Saharan Africa including Ethiopia (2).

IMNCI strategy helps to easily identify step by step the problem that children have when we see then their living areas and at the health post. This includes segregating simple diseases from the sever ones, urgently referring those children with severe illnesses to the next health facility, deciding what can be done for the child with simple illness, what kind of

care can be given at his home and what can be done to him if his illness gets severe. In addition to this the strategy will help to focus on major disease of children, how to prevent these diseases and how the family and the community can participate and be major activities of this strategy as a tool for disease prevention, family and community participation and behavioral change, which are the principles of the strategy (3).

Methods

Study design and period:Community based study was conducted from December 20 to January 20/ 2014.

Study area/setting:The study was conducted in Enebse Sarmider Woreda, East Gojjam Zone of Amahra Regional State, and Ethiopia. Enebse Sarmider Woreda is located 365 kilometers far from Addis Ababa. The woreda administratively divided in to 2 urban and 33 rural Kebles with a number of small Gotes. There are seven health centers, 35 health posts and five private health facilities to give service for 154253 total population, 20453 under five years children and 31563 households. All seven health center have IMNCI trained health workers. The rural population accounts for 88.9% of the Woreda total population. The area has three geloclimatic zones. Dega accounts for 14%, Weinadega constitutes 33% and kola accounts for the remaining 53%. Among under-five ten top diseases in the woreda pneumonia and diarrhea are the leading cause of morbidity and mortality (4).

Data collection instrument and collectors:The data for this study were collected by using structured questionnaire modified from the standard WHO IMNCI exist interview, which was prepared in English and translated into Amharic language for field work purpose and back to English for checking language consistency. Types of drug prescribed were registered in field note before going to field. The data were collected by nurses. Seven data collectors were collected data from care taker in their households. Two BSC nurses were assigned as a supervisor. Data collectors and supervisors were given training for 1 day on how to use the questionnaire on interviewing, privacy, discipline and approach to respondents.

Data quality control:A pre-test was carried out on 25 care takers at Goncha Siso Enese woreda and after pre-testing, comments were included in the questionnaire and experiences were obtained on how to proceed in the final data collection. For each data collector, one guide was assigned. The supervisors and principal investigator have closely followed and supervised the day to day data collection process and ensure completeness and consistency.

Data processing and Analysis:The questionnaires were checked for completeness and consistency by the principal investigator and supervisors prior to the analysis. Errors related to inconsistency were verified using cross tabulation and other data exploration methods. Then recoded, categorized and sorted to facilitate its analysis. The data were analyzed using SPSS version 16.0. Descriptive analysis was used to describe the number distributions of the respondents by socio-demographic characteristics and other relevant variables in the study. Furthermore, logistic regression, specifically Bivariate and multivariable analysis, were used to identify factors affecting care takers compliance on IMNCI antibiotic treatment and counseling. A $p\text{-value} < 0.3$ was used to select candidate variables for multivariable analysis. The crude and adjusted odds ratio together with their corresponding 95% confidence intervals was computed. A $P\text{-value} < 0.05$ was considered to declare a result as statistically significant in this study. The result was presented in text, tables and graphs.

Results

Socio-demographic characteristics

In this study of 394 care takers, 373 care takers with children less than five year were voluntary to be interviewed while ten (10) declined to participate and the rest eleven (11) were not at home after repeated visits, making the response rate 94.7 % with (non-response rate 5.3%) and not included in the analysis.

Three hundred twenty seven (87.7%) care takers were female. The age of care takers ranged from 15 years to 54 years with a mean of 30.04 years and standard deviation 10.134 years. Regarding to age categories of the respondents 107(28.7%) were 15-24 years, 134(35.9%) were 25-34 years, 80(21.4%) were 35-44 years and 52(13.9%) were 45-54 years. Two hundred ninety four (78.8%) care takers were live in rural. Three hundred twenty (85.8%) care takers were married. (Table1)

As to the educational background 101(27.1%) were illiterate, 57(15.3%) were read and write, 47(12.6%) were primary school, 78(20.9%) were secondary school and 90(24.1%) were post-secondary school. Among care takers in this study 215(57.6%) were housewife, 42(11.3%) were Government employee, 39(10.5%) were private/NGO employee, 28(7.5%) were farmer, 12(3.2%) were merchant, and the rest 37(9.9%) were others. (Table 1)

The monthly household income of the respondents ranges between 200 to 2245 Birr with a media of 550 Birr, standard deviation 484.082 Birr. Regarding to monthly income 99(26.5%) have monthly income less than 345 birr, 100(26.8%) have monthly income between 346-550 birr, 83(22.3%) have monthly income between 551-890 and the rest 91(24.4%) have monthly income above 891 birr. Two hundred sixty two (70.2%) care takers have only one under five year child, 107(28.7%) have two under five child and 4(1.1%) have three under five year child. Three hundred seven (82.3%) of children were brought to health center by their mothers (Table 1)

Table 1: Socio-demographic characteristics of care takers in Enebse Sarmider woreda, in 2014.

Variable	N (%)	
Sex	Male	46(12.3)
	Female	327(87.7)
Age	15-24 years	107(28.7)
	25-34 years	134(35.9)
	35-44 years	80(21.4)
	45-54 years	52(13.9)
Residence	Urban	79(21.2)
	Rural	294(78.8)
Marital status	Married	320(85.8)
	Divorced	36(9.7)
	Windowed	17(4.5)
Educational	Illiterate	101(27.1)
	Read and write	57(15.3)
	Primary school (1-8 grade)	47(12.6)
	Secondary school	78(20.9)
	Post-secondary school	90(24.1)
Occupation	House wife	215(57.6)
	Government employee	42(11.3)
	Private /NGO employee	39(10.5)
	Farmer	28(7.5)
	Merchant	12(3.2)
	Others	37(9.9)
Monthly income	< 345 birr	99(26.5)
	346-550 birr	100(26.8)
	551-890 birr	83(22.3)
	> 891 birr	91(24.4)

Number of under 5 year children	one child 262(70.2)	
	two child 107(28.7)	
	three child	4(1.1)
Relationship of respondent to child	Mothers 307(82.3)	
	Fathers 50(13.4)	
	Grandmother 71(0.9)	
	Grandfather 41(0.1)	
	Co mother 20(0.5)	
	Others 30(0.8)	

Health service, care and care seeking

Among the respondents 169(45.3%) were knowledgeable regarding to recommended action. Two hundred eighty five (76.4%) of care takers believes on severity of illness. Regarding to health seeking behavior 132(35.4%) of care takers first noticed that the child was sick 1day before attending the health , and the rest 50(15.5%) of care takers first noticed that the child was sick more than four days before attending the health center. The number of days ranged from 1 to 12 days with a mean 2.24 days and SD 1.371(Table 2).

Table 2:-Knowledge, believe on severity of illness and number of days first noticed in health center in Enebsa Sarmider Woreda in 2014.

Variable	Categories	N (%)
Knowledge	Knowledgeable	169(45.3)
	No knowledgeable	45.3(54.7)
Believe on severity of illness	Yes	285(76.4)
	No	88(23.6)
Number of days sick before attending health center.	One day	132(35.4%)
	Two days	111(29.8%)
	Three days	80(21.4%)
	Greater than or equal to four days	50(15.5%)

Time taken to reach health center from their residence were ranged from 5 minutes to 360 minutes with median 65 minutes and standard deviation 62.376 minutes. Regarding to waiting time at health center 173(46.4%) was said that take long time. Regarding to trust on health worker 107(28.7%) were satisfied by the service delivered by health worker during visit on health center. (Table3)

Table 3:- Time taken to travel from home to health center, in Enebse Sarmider Woreda in 2014.

Variable	Categories	Frequency (%)
Total time taken	0-60 minutes	176(47.2)
	> 60 minutes	197(52.8)
Waiting time at health center	Too long time	15(4)
	Long time	173(46.4)
	Acceptable time	142(38.1)
	Short time	43(11.5)
Satisfaction with service	Satisfied with the service	107(28.7)
	Not satisfied with the service	266(71.3)

Counseling

Care takers compliance towards over all IMNCI counseling was 102(27.3%). Among 373 respondent 357(95.7%) were compliance towards immunization, 209(56%) were compliance towards feeding/breast feeding practice and 144(38.6%) were compliance towards follow-up.

Counseling to immunization

Counseling regarding to immunization was given for 373 care takers. After return from health center 357(95.7%) the respondents immunized their children fully and follow regularly for those not complete immunizations.

Counseling to feeding/breast feeding practice

Counseling regarding to breast feeding/feeding was given for 373 care takers. Among 373 respondents 209(56%) of care takers were compliance towards feeding/breast practice (give more liquid or breast feeding than usual) and the rest 164(44%) noncompliance to counseling. Reason for noncompliance regarding to recommended action 72(43.9%) were did not know the importance of breast feeding and additional feeding practice, 32 (19.5%) were said that the child was not willing to drink, 35 (21.3%) were said that I have no money, the 17 (10.4%) said that the child was unable to drink, 8 (4.9%) were said that fear of worsen the illness.(Figure 1)

Counseling to follow-up

One hundred forty four (38.6%) of care takers were compliance to recommended follow up visit and the rest 229(61.4%) noncompliance to recommended follow up visit. Reason for noncompliance of recommended action 95(41.6%) were said that the child was improved, 43 (19 %) were said that I forgot follow up date, 26(11.5%) said that health center was far from my residence, 23 (10%) was said that I have no trust on health worker, 17(7.5%) were said

that I have no money, 13(4.4%) was said that the child condition become worse, 9(4%) were said that I start traditional medicine and the rest 3(2%) were said that I have no time.(Table 5)

Table 5:- Reasons for noncompliance to recommended follow-up visit, in Enebse sarmider Woreda, in 2014.

Reason	N (%)
Forget	43(19)
Child was improved	95(41.6)
Child condition become worse	13(4.4)
Start traditional medicine	9(4)
Have no time	3(2)
Have no money	17(7.5)
Have no trust on health worker	23(100)
Distance from health center	26(11.5)
Total	229(100)

Analytic Part

Counseling

Results from statistical table7 shows that care takers with age categories between 25-34 years were significantly associated with compliance towards IMNCI counseling having (AOR=2.118, 95% CI: 1.042, 4.305), care takers with post-secondary education were significantly associated with compliance towards IMNCI counseling having (AOR=2.959, 95% CI: 1.354, 6.463), knowledgeable care takers were significantly associated with compliance towards IMNCI counseling having (AOR= 2.574, 95% CI: 1.482,4.469), trust on health workers were significantly associated with compliance towards IMNCI counseling having (AOR= 2.781, 95% CI: 1.344, 5.752) and care takers travel less than or equal to one hours were significantly associated with compliance towards IMNCI counseling having (AOR= 2.214, 95% CI: 1.254, 3.91).

Table 7:- Factors associated with care takers compliance towards IMNCI counseling in Enebse sarmider Woreda in 2014.

Variable		Compliance	Non compliance	Crude OR/95% CI/	Adjusted OR /95%CI/	P-value
Care Sex of care takers	Female	94	233	1	1	0.177
	Male	8	38	1.916(0.862, 4.261)	2.118(0.712, 6.295)	
Age of care takers	15-24 year	32	75	1	1	0.038
	25-34 year	21	113	2.296(1.231, 4.281)**	2.118(1.042, 4.305)*	
	35-44 year	28	52	0.792(0.427, 1.471)	1.098(0.538, 2.242)	
	45-54 year	21	31	0.63(0.315, 1.258)	0.758(0.353, 1.63)	
Place of residence	Urban	30	49	1.888(1.115, 3.196)	0.703(0.337, 1.467)	0.348
	Rural	72	222	1	1	
Educational status of care takers	Illiterate	43	58	1		0.007
	Read and write	19	38	1.483(0.753, 2.919)	1.127(0.52, 2.443)	
	Primary school	12	35	2.162(1.006, 4.648)*	2.23(0.888, 5.601)	
	Secondary school	13	65	3.707(1.815, 7.572)***	2.22(0.67, 7.36)	
	Post secondary school	15	75	3.707(1.877, 7.32)***	2.959(1.354, 6.463)**	
Occupation of care takers	House wife	66	149	1	1	0.008
	Gov. employee	4	38	4.208(1.443, 12.271)**	1.239(0.292, 5.268)	
	Private /NGO employee	5	34	3.012(1.128, 8.045)*	1.491(0.378, 5.876)	
	Merchant	3	9		2.287(0.521, 10.05)	
	Farmer	15	13	1.329(0.349, 5.067)	0.374(0.134, 1.042)	
	Others	9	28	0.384(0.173, 0.852)**	2.26(0.908, 5.624)	
				1.378(0.616, 3.082)		
Monthly income of care takers	< 345 birr	31	68	1	1	0.934
	345-550 birr	25	75	1.368(0.735, 2.544)	1.326(0.64, 2.745)	
	551-890 birr	21	62	1.346(0.701, 2.584)	1.365(0.617, 3.018)	
	> 891 birr	25	66	1.204(0.643, 2.251)	0.961(0.374, 2.469)	
Knowledge	Knowledgeable	28	141	2.866(1.746, 4.699)***	2.574(1.482, 4.469)***	0.001

of care takers	Non knowledgeable	74	130	4.707)*** 1		
Trust on health worker	Those satisfied the service delivered by health worker	12	95	4.048(2.109, 7.77)***	2.781(1.344, 5.752)**	0.006
	Those do not satisfied the service delivered by health worker	90	176	1	1	
Distance	Those travel less than or equal to one hour	28	148	3.18(1.936, 5.224)***	2.214(1.254, 3.91)**	0.006
	Those travel more than one hour	74	123	1	1	

*= Significantly associated with compliance towards IMNCI counseling when p value close to 0.05.

**= Significantly associated with compliance towards IMNCI counseling when p value close to 0.01.

***= Significantly associated with compliance towards IMNCI counseling when p value close to 0.001.

CI = Confidence interval and others= include students, daily labors

Discussion

Non-compliance is defined as any deviation by a patient from health workers instructions. Non-compliance with medications is particularly important in clinical practice. This form of non-compliance has been found to be associated with treatment failure and all its consequences, namely: deterioration of patients' health, the need for additional consultations, and the use of extra drugs, additional hospital admissions and increases in direct and indirect costs of management.

Care takers compliance towards breast feeding/feeding was 56%. This is higher than the study conducted in Hawassa town which has compliance towards counseling 28.2%. Reason for noncompliance regarding to recommend action majority (43.9%) were did not know the importance of breast feeding and additional feeding practice and 21.3% were said that I have no money. The study conducted in Hawassa town indicate that the reasons given by care takers for giving less fluids were: did not know importance of giving more fluid 26.6%, unable to suck 22.5% and child did not want to suck 21.7%. This is relatively similar to the present finding (5).

Care takers compliance towards follow up was 38.6%. The study conducted in Afghanistan shows that most caretakers 75% complied with referral advice. This is different from the findings of this study because compliance to follow-up higher than the present finding 38.6%. The study conducted in Sudan shows that compliance with a follow-up recommendation was 44.5%. This is relatively higher than the findings of this study. The study conducted in Hawassa shows that compliance to recommend follow-up visit was 19.7%, which lower than the findings of this study. The study conducted in KwaZulu Natal, South Africa compliance with the primary referral was reported by less than half (45%) of care givers which is higher than the findings of this study (6, 7, 5, 8). The difference may be due to socio-demographic difference between the study area.

Reason for non compliance of follow up majority 41.6% of the respondent said that the child was improved and 19% were said that I forgot follow up date. This is relatively similar to the study conducted in Hawassa health center which has 39.0% of care takers who did not attend follow up said because their child had improved, 22.9% said that they had forgotten the appointment (24).

Compliance towards IMNCI counseling is low (27.3%) in this study. It was affected by age categories, educational status, and trust on health workers, care takers knowledge and availability of health center nearby place of residence.

Knowledgeable care takers were 2.574 times more likely significantly associated with compliance to IMNCI counseling than non-knowledgeable care takers. The result of this study may suggest care takers compliance to IMNCI counseling increase when knowledge increases. Care taker knowledge is important since when the care takers implement the counseling practice incorrectly the child nutritional status may be decreased and the child health status becomes worse, the final result may be death. In order to avoid such condition knowledgeable care takers were more compliance than non-knowledgeable care takers.

Care takers those satisfied by the service delivered by health workers were 2.781 times more likely significantly associated with compliance to IMNCI counseling than those do not satisfied by the service delivered by health workers. The result of this study may suggest care takers compliance towards IMNCI counseling increase when the health works delivered quality health services. Quality health service is important since when the care takers satisfied by the service implement the counseling practice correctly the child nutritional status improved and the child health status becomes good.

Those care takers travel from home to health center with less than or equal to one hours were 2.214 times more likely significantly associated with compliance to IMNCI counseling than those travel more than one hours. This indicate that when care takers live nearby health center the probability of getting information regarding to IMNCI increase and the health workers get the care takers easily. This give chance that the health workers do easily close supervision and give counseling.

Post secondary educated care takers were 2.959 times more likely significantly associated with compliance to IMNCI counseling than illiterate care takers. The result of this study may suggest care takers compliance to counseling increase when educational status increases. Care taker education is important since when care takers give care for their child based on the counseling the child health status becomes well and produce productive future generation. In order to create productive future generation educated care takers were important than non educated care takers. When educational status increase other associated factors like knowledge and job opportunity also improved.

Age categories between 25-34 years were 2.118 times more likely significantly associated with compliance to IMNCI counseling. The result of this study may suggest care takers compliance to counseling decrease when care takers age increase and very young age care takers. This is may be due to when the care taker is very young there is no experience regarding to child caring practice and when care takers age becomes old the capacity that give care according to the instruction decrease.

Conclusion

The finding of the study confirmed that high rates of noncompliance with IMNCI counseling.. Compliance towards IMNCI counseling was significantly associated with age, educational status, knowledge, trust on health workers and distance from health center. In general educational status, occupation, knowledge, trust on health workers, age and distance from health center were identified as factors influencing compliance towards IMNCI treatment and counseling.

Declarations

Ethics approval and consent to participate

Ethical approval was obtained from Wollo University College of health Science ethics committee.

Consent for publication

Not applicable.

Availability of data and materials

The datasets used and/or analyzed during the current study are available from the corresponding author on reasonable request.

Competing interests

The authors declare that they have no competing interests.

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Authors' contributions

DA conceptualized the paper. DA,TZ, performed article search, data extraction, and data analysis. DA and TZ did critical review. TZ produced the first draft of the manuscript. All authors contributed to the interpretation, commented on multiple versions, and approved the final manuscript.

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Figures

Figure 1

Reason for non compliance for counseling of feeding/breast feeding practice