



Investigating Associations between Parent Support Groups and Integrated Outreach Services for Maternal and Infant Survival: Experiences from a Project in Northern Uganda

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Authors' contributions

This work was carried out in collaboration among all authors. Author GKS analyzed the data and wrote first draft of the manuscript. Authors RM and GB refined draft manuscripts. Authors AK and AT managed the database for HMIS data. All authors read and approved the final manuscript.

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ABSTRACT

Background: Globally various interventions have been undertaken to reduce maternal and child mortality rates. In low-income countries, outreach services are used systematically to deliver immunization and other health services to individuals with limited access to health facilities. In 2012, an Integrated Community Outreach Program (ICOP) was introduced by World Vision to provide women, children and their families with vital interventions like antenatal care, family planning services and on-spot treatment of illnesses with the aim of improving maternal, newborn and child health in Kitgum district, Uganda. To increase the appeal of these outreach services in targeted communities and facilitate compliance, parent support groups (PSGs) were also established as an intervention.

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Aim: The objective of this study was to investigate whether there is an association between parent support groups (PSGs) and integrated outreach services (IOS) for maternal and infant survival in Kitgum.

Methods: We conducted a cross-sectional survey in 4 of 10 sub-counties in Kitgum where data was collected from 767 households using structured questionnaires. In addition, qualitative data was collected through in-depth interviews with key stakeholders. The association between each IOS outcome and PSGs was investigated using chi-square tests. For cross-tabulations with small counts, Fisher's exact test was used.

Results: PSGs were found to be significantly associated with most of the integrated outreach services. A strong association was observed between being in a PSG household and seeking antenatal care at least four times (chi-square=14.18, p-value=0.0002) as more likely when compared to non-PSG households. Similarly, significant associations were observed between being in a PSG household and having immunized the child for measles (chi-square=6.66, p-value=0.0099) and between being in PSG household and weighing of children (chi-square =9.59, p-value=0.002).

Conclusion: PSGs present a promising intervention for scaling up uptake of Integrated Outreach Services in remote settings which is integral to addressing the problem of maternal and infant survival.

Keywords: Maternal and infant survival; child survival; child health; childhood illnesses; integrated services.

1. INTRODUCTION

Globally, most countries have made significant advances in reducing maternal and child mortality rates [1]. For instance the global mortality rate for children under five dropped by 41% from 87 deaths per 1,000 live births in 1990 to 51 in 2011 and the maternal mortality ratio has declined by 47% over the last two decades from 400 maternal deaths per 100,000 live births to 210 [2]. Despite these achievements, most low and middle-income countries are still faced with disproportionate inequalities in maternal and child health among different segments of their populations [3]. For instance, increasing child deaths are concentrated in the poorest regions and in the first month of life [2]. In sub-Saharan Africa, the combined maternal mortality ratio is nearly 600 deaths per 100 000 live births; almost twice that of South Asia, four times as high as in Latin America and the Caribbean and nearly 50 times higher than in industrialized countries [4,5].

There has been a major emphasis on the persisting burden of maternal, newborn, and child mortality globally with a particular focus on the Millennium Development Goals (MDGs) for maternal and child health [6]. Consequently, interventions aimed at reducing maternal and child mortality rates like promotion of immunization, antenatal and neonatal services, health and nutrition education, and growth monitoring promotion have been implemented in low- and middle-income countries [3] in order to meet the MDG target of a two-thirds reduction in

child deaths and reducing maternal mortality ratio by three quarters by 2015.

The integration of immunization services with other priority reproductive, maternal, newborn and child health services, also the 4th strategic objective of the global vaccine action plan (GVAP), offers a wider range of health interventions through holistic approaches to health promotion and disease control [6,7]. In a systematic review of over forty health services integration programs, Wallace et al. [8] identified a number of benefits including rapid uptake of interventions, increased access to services, better staff morale, more equity between populations and higher efficiency. They however noted that successful integration requires program compatibility, support from key stakeholders and decentralization of health services.

1.1 Integrated Outreach Services (IOS)

Outreaches have been used to deliver routine immunization services especially to populations living in remote areas with limited access to fixed services in many low-income countries. Usually defined as planned, regular and periodic single-day visits by qualified staff from a health facility, outreaches remain a key strategy for providing services to underserved or hard-to-reach groups. In addition to providing routine immunizations, outreaches present opportunities to provide women, children and their families with other vital interventions such as Vitamin A supplementation,

deworming tablets and Insecticide-treated nets [9]. Moreover, although emphasis on facility-based care and emergency obstetric care from those concerned with maternal survival is understandable, some maternal, newborn and child health (MNCH) services like growth monitoring and promotion (GMP) are more effective when delivered at community level through outreaches. The four major themes of World Health Organization (WHO)/UNICEF Global Immunization Vision and Strategy (GIVS) suggest that although immunizing more people against more diseases is a priority, so is integrating immunization and other critical interventions. Linking immunization with other interventions during outreaches has the potential to be particularly strategic. A case in point is the Zambia Growth Monitoring Program Plus (GMP+) in which vitamin A supplementation, family planning, health education, immunization and infection treatment were delivered with an integrated approach and the coverage and timeliness of immunization improved [10]. Uganda currently delivers an integrated package during outreaches that includes antenatal and postnatal services, family planning promotion, GMP, anaemia testing, HIV couple testing and counseling, immunisation, health and nutrition education.

1.2 Background to Formation of Parent Support Groups

In 2012 World Vision, through the East Africa Maternal Newborn and Child Health (EAMNeCH) Project¹, the Ugandan Health Ministry and Kitgum District Local Government introduced an Integrated Community Outreach Program (ICOP) to provide women, children, and their families with vital interventions, such as antenatal care, family planning services and on spot treatment in case of an illness with the aim of improving MNCH in Lagoro and Mucwini Sub-counties of Kitgum District by June 2016. The ICOP was designed to increase community understanding and uptake of maternal and child health services. The integrated packages included antenatal and postnatal services, family planning promotion, growth monitoring promotion, anaemia testing, HIV couple testing and counseling, health and nutrition education and immunization. In order to increase the appeal of these outreach services to targeted communities and facilitate compliance,

parent support groups were established as an intervention in the targeted communities.

A parent support group (PSG) is a voluntary association of persons with the view of supporting each other by sharing experiences in addressing definite common problems affecting their communities in respect to reducing maternal, neonatal, infant and childhood morbidities and mortalities [11]. In the past, PSGs were mainly composed of women who were given little or no opportunity to discuss their problems with healthworkers which led to poor child health services [12]. However, male involvement in outreach services has been shown to improve vaccination rates especially in rural areas [13] and there was a deliberate effort for the PSGs within the EAMNeCH project in Kitgum district to involve males.

While PSGs were established to increase the appeal, promote understanding and increase uptake of integrated services provided at community outreaches and facilitate compliance, there was limited information to show whether male involvement and PSGs in general increases uptake of integrated outreach services reducing maternal, neonatal, infant and childhood morbidities and mortalities. More specifically, this study sought to investigate whether there is a relationship between PSGs and the uptake of specific integrated outreach services of growth monitoring promotion, antenatal and postnatal care attendance, immunization promotion, male involvement in ICOP activities.

1.2.1 PSG project design: formation and activities of a PSG

A PSG is composed of a mixture of 10 pregnant and breastfeeding mothers with children below 2 years and their partners; 1 person with disability and their spouse; 1 Village Health Team (VHT) member and 1 lead mother of child above 2 years with husband. In total there are 25 members per PSG in the village. Members meet monthly for 1-2 hours to discuss and dialogue issues pertaining to maternal and child care. In addition the groups are supported, through VHT training, to collectively set up home-gardens and establish income generating activities that actively involve both men and women as the decision makers for the resources of their households.

The PSGs therefore harness the provision of quality Maternal Newborn and Child Health (MNCH) in the community by providing an

¹ EAMNeCH project seeks to improve MNCH in selected communities through improved health system strengthening, education, sustainable nutrition and market diversity between 2011-16.

opportunity to members to meet and support each other, link them to available health and social services in the community and the formal sector. On completion of their 1000-day period couples are graduated and awarded 'golden bows' and certificates in graduation events during the World Breastfeeding Week commemoration so that communities and community leaders can recognize their contribution.

For the success of this intervention, the VHT does community mobilization at the grassroots for their respective villages to ensure all children below 2 years attend monthly GMP and pregnant mothers access their ANC visits. In PSGs the community is sensitized on the services they should demand at the outreach and the importance of weighing their children below two years on a monthly basis. During the monthly meetings led by a VHT, a given topic is discussed. Furthermore, two model homes in every group are selected and supported to practice small scale farming by putting up backyard gardens and chicken rearing. PSG members also visit peers' home to observe water, sanitary and hygiene facilities such as pit latrine, tippy tap, rubbish pit, kitchen utensils' drying rack among others, and to assist in mobilization of other people to seek integrated health services.

1.3 Study Objectives

The main objective of this study was to investigate whether there is an association between parent support groups (PSGs) and integrated outreach services (IOS) for maternal and infant survival in Kitgum district, Uganda.

The specific objectives were:

1. To explore the perceptions of key stakeholders on PSGs

2. To examine community health practices in PSG versus non PSG communities
3. To investigate associations between PSGs and IOS for maternal, newborn and infant survival

The focus of this manuscript is mainly on objective 3.

2. MATERIALS AND METHODS

2.1 Study Area

This study area was Kitgum district in northern Uganda. The study was conducted in 4 of 10 sub-counties in Kitgum namely Lagoro, Mucwini, Namakora and Omiya-anyima. Mucwini and Lagoro sub-counties were selected for intervention because only 27.2% of their children go for immunization by 9 months of age; while 41.2% of the mothers do not attend 4 quality ANC visits and 46% do not go for Post Natal Care [14]. Namakora and Omiya-anyima sub-counties were randomly selected from the remaining 8 to act as the control. Lagoro consists of 4 parishes and 45 villages; Mucwini has 10 parishes and 84 villages; Namakora 4 parishes and 33 villages; and Omiya-anyima has 4 parishes 56 villages.

2.2 Study Design

This was a mixed-methods study using both quantitative and qualitative approaches. For the quantitative part we conducted a cross-sectional survey in 4 of 10 sub-counties in Kitgum district. Of the 4 sub-counties selected; 2 sub-counties (Namakora and Omiya Anyima) received the standard MoH integrated outreach services (non PSG) and, in the remaining 2 sub-counties (Lagoro and Mucwini), parent support groups had been established (3 years prior to this study) with the aim of improving uptake of integrated outreach services. The study design is illustrated in Fig. 1 below:

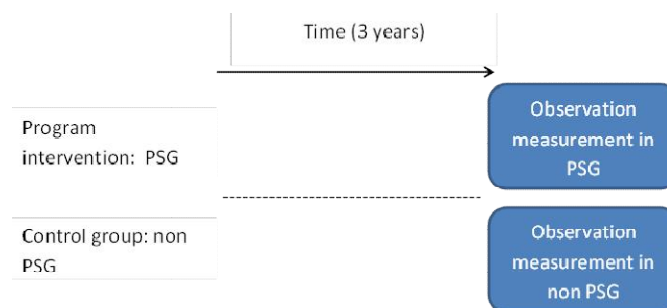


Fig. 1. Illustration of the study design: Static group comparison

PSGs were introduced in 2 communities and after 3 years, uptake of IOS was compared between 2 sub-counties that received the PSG intervention with 2 sub-counties that received standard care (non PSG) in a cross-sectional survey. The qualitative part of the study used interviews with key stakeholders to deepen understanding on how the PSG model was conceptualised and applied. Data from the survey and interviews was supplemented and contextualised by district health management information system (HMIS) data for Kitgum.

2.3 Sampling and Selection of Study Participants

A list of villages and population size for each village was obtained from the district. We randomly selected ~30% of villages in each parish of Mucwini, Namakora and Lagoro and Omiya-Anyima sub counties. Prior to the survey, mapping of all houses in the villages was done manually. A pilot study to test questionnaires was conducted in 3 villages precluding the survey villages. Non-residents, visitors or those residing in the area for less than 1 year were excluded from the study. A two-stage sampling scheme was applied: 30 parishes were planned for selection and from these up to 12 villages randomly selected to form the sampling frame for the recruitment of participants. All households with children less than 2 years in the selected villages were included in the study and a mother or caretaker was interviewed for the survey. If more than one child in a household were less than 2 years, reference was made to only the younger child; if no member of the household was less than 2 years the interviewer moved to the next house. Participants for the qualitative part of the study were selected purposively to obtain particular information pertaining to PSG. Critical stakeholders of the PSG project were the key informants for this study and included World Vision staff, the district health team (Kitgum) and different cadres of healthworkers (with a focus on midwives and VHTs). Overall data were collected from 762 households and 10 key informants between January to April 2014.

2.4 Data Collection

For quantitative data collection a structured questionnaire was administered to a couple or individual with a child less than 2 years in a household. Data from secondary data sources was also reviewed. This was mainly project documents and district HMIS data on

immunisation coverage, antenatal care attendance, morbidity from diarrhoea and malaria among others. Data for the qualitative questions was collected using in-depth interviews with key informants.

2.5 Data Analysis

2.5.1 Quantitative data

Descriptive statistics of frequencies, means (standard deviations), proportions or percentages were used to explain the household characteristics. The chi-square tests were used to determine whether frequency distributions differ substantially or assess any differences in proportion.

Social demographic characteristics at individual level and IOS such as antenatal care, immunisation, growth monitoring were compared between PSG and non PSG group members using chi-square tests. In the findings section we present trends of ANC, immunisation, morbidity from diarrhoea in children and service utilisation over the years prior to this study from the Kitgum district HMIS data for the dates that outreach service started. Continuous variables such as age was categorised as <19, 20-29, >35. We further describe associations between (PSG versus non PSG members) groups with uptake of the following outcomes; antenatal care, immunisations, growth monitoring, male involvement at individual level adjusting for other factors associated with each of the outcomes. Analyses were done using R version 3.1.2.

2.5.2 Secondary data

Information and reports from IOS and PSG were content analysed to indicate whether messages for improved uptake of IOS were well received. Analysis was also done on possible behavioural change within the community – specifically relating to MNCH health service access and utilisation.

2.5.3 Qualitative data

The analysis of qualitative data was undertaken manually to determine the thematic issues emerging from the study objectives. Raw data was transcribed and then coded to plot key themes. The focus of qualitative data was on understanding local awareness levels and perceptions on PSGs. We analysed community

experiences, perceived benefits and shortcomings of the PSG model as well as lessons learnt. The questions were cognizant of the broader framework of the project goal which is improving maternal and child health.

2.6 Ethical Considerations

Ethical approval was received from the Committee for Higher Degrees, Research and Ethics at Makerere University School of Public Health (MakSPH) and the Uganda National Council of Science and Technology (UNCST). Clearance to conduct the study was also sought from the District Health Office (DHO) of Kitgum district. At the sub-county and community level we availed information about the study before requesting for voluntary and informed consent from study participants. Confidentiality and anonymity was maintained throughout the study and participants were assured of private and free expression.

3. RESULTS AND DISCUSSION

3.1 Socio-demographic Characteristics of Study Participants

At the individual level, significant differences were observed for age distribution between PSG and non PSG. The PSG members tended to be older than non PSG. The difference in educational levels of PSG and non-PSG members was insignificant and we also found a non-significant difference of individual's length of stay in the area between the two groups. Furthermore, there was no statistically significant difference between PSG and non-PSG in any of

the member categories such as VHT. Table 1 below gives a breakdown of participant demographic data.

3.2 HMIS Data

Health facility data are critical in assessing national progress, trend analysis and provide a basis for national and district performance assessment. In Uganda the Health Management Information System (HMIS) facilitates data collection during health service delivery and covers individual clients, preventive and curative services and resource management. Quality data should be collected regularly and aggregated to assess performance; however the reality is that this data may have limitations such as missing values and bias. The HMIS provide estimates for population coverage rates of key health indicators, with some assumptions made about the data, denominators and population.

In 2010 Kitgum was among the districts with declining trends of coverage for antenatal attendance, immunization, childhood nutrition and morbidity. The next section presents HMIS data on trends of selected indicators for maternal and child health including ANC attendance; immunisations; severe malnutrition, and diarrhoea cases prior to the introduction of PSGs in Kitgum district.

3.2.1 Antenatal care

Fig. 2 below shows a slightly increasing trend in reporting for new ANC attendance as well as re-attendance from 2010 to-2011. The 4th ANC visits are generally lower than the 1st.

Table 1. Socio-demographic characteristics of study participants in PSG and non PSG groups

Characteristic	PSG n=302	Non-PSG n=465	P- value
Age			
≤19	16 (5.3)	54 (11.6)	0.003
20-29	174 (57.6)	275 (59.1)	
35+	112 (37.1)	384 (28.1)	
Highest level of education			
None	45 (14.9)	97 (20.9)	0.3
Primary	231(76.4)	323 (69.4)	
Secondary	25 (8.3)	38 (8.2)	
Higher education/technical	0	63 (4.6)	
/University			
Other	1 (0.3)	2 (0.4)	
Length of stay in the area			
<1yr	6 (2.0)	23 (5.0)	0.10
1-3yrs	46(15.2)	63 (13.6)	
>3yrs	250 (82.8)	379 (81.5)	

3.2.2 Diarrhoea

Data shows a marked decline in levels of diarrhoea towards the end of 2010. The numbers of episodes remain relatively low and stable from 2010-2011. Males were more likely to report diarrhoea than females. The patterns of episodes may also reflect seasonal variations – such as during the rainy season more episodes would be observed than during dry seasons. Fig. 3 shows that trends of diarrhoea remain relatively low and stable after 2010.

3.2.3 Malnutrition

Poor nutrition places children at an increased risk of morbidity and mortality especially those aged

less than 5 years. Anthropometric measurements provide one of the most important indicators of children’s nutritional status. A declining trend in malnutrition was observed from 2011 and levels remain relatively low compared to when the PSG’s were newly introduced in 2012.

3.2.4 Immunisation

Fig. 5 below shows distribution of measles vaccine administered during postnatal care over the reported quarters. There was a marked increase in the first quarter of 2011 and a stable trend in receipt of the measles vaccine in 2011.

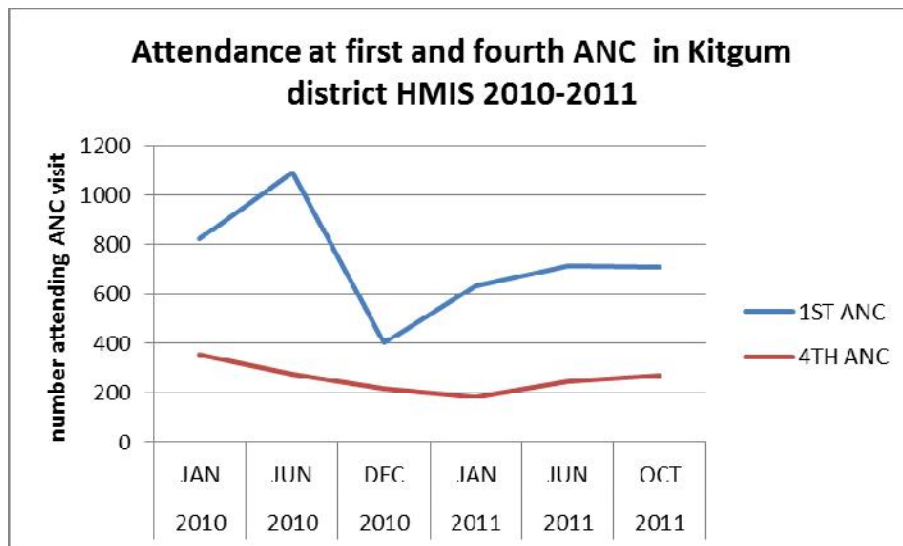


Fig. 2. Trends in ANC attendance for period 2010-2012

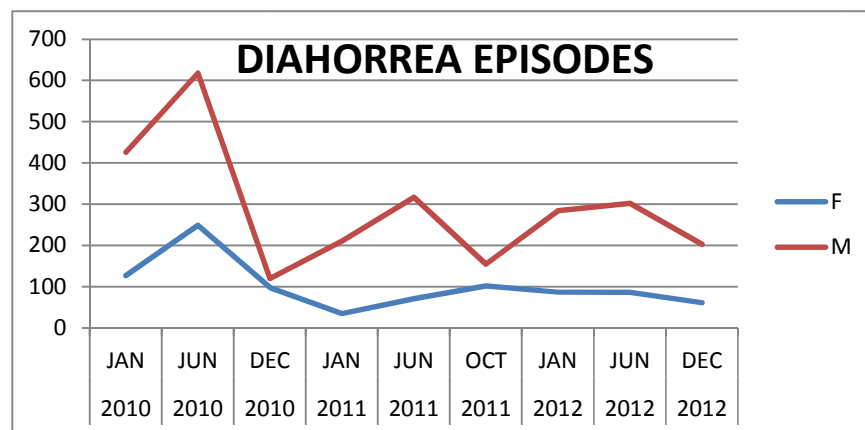


Fig. 3. Trends in reported diahorrea episodes in Kitgum district by gender

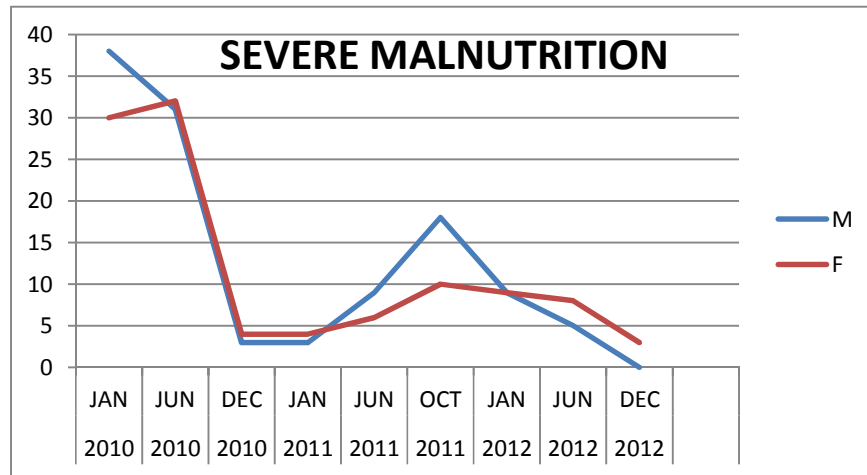


Fig. 4. Trends in severe malnutrition in Kitgum district by gender

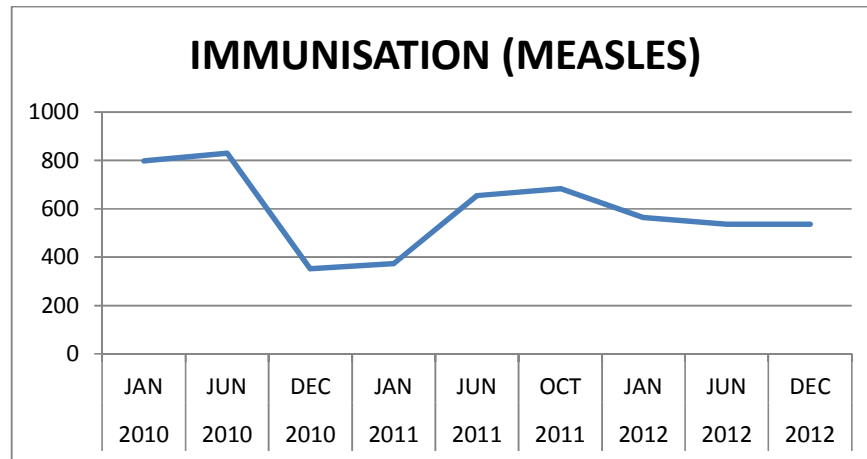


Fig. 5. Trends in measles vaccine receipt levels over reported quarters

3.3 A Summary of Community Perceptions of PSG

We sought views of study participants on whether or not PSG membership was beneficial. The majority (95.7%) of the respondents mentioned that PSG membership was beneficial with only 4.3% reporting having not benefited from being a PSG member. Participants reported that PSG membership had contributed to improvement of their family's well-being with enabling parents to take all children for immunization as mostly reported benefit (75.2%). Other benefits mentioned included gaining knowledge on what to feed the baby (64.6%), respecting of spouse and creating unity at home (53.0%), increased demand for GMP services (39.4%) as well as understanding and engaging

in positive health behaviours such as sleeping under mosquito nets and using family planning. Fig. 6 below illustrates this further:

A female study participant had this to say:

Ever since my husband and I joined Omuk-Luru Group, the way we handle our home matters has changed. My husband is more involved in raising our three children and he lets me make some decisions like what we shall eat and how some money can be used for the children's well-being. He was very supportive when I was pregnant with our last son and he even takes him to the health centre when he is sick and I am not able. I am happy with all the knowledge I have got from the group (Female Community member)

The perceived benefits reported by community member are, in fact, standard services serving the project as seen in the words of a health worker below:

It [PSG project] targets mothers and children 0-2 years. For pregnant women we monitor them during outreaches. We carry out HIV testing and PMTCT, growth monitoring and monthly screening for malnutrition. We give health education concerning breastfeeding and nutrition, health during pregnancy and personal hygiene. We do postnatal care for those who have delivered; we retest their HIV status and give them folic. We also give family planning during outreaches (Midwife, Muchwini)

3.4 Overview of Community Health Practices in PSG and Non-PSG Households

Overall 767 households were included in the survey, >90% were male headed households. Table 2 outlines study household characteristics and socio-economic indicators in PSG versus non PSG households. Overall 697 (91%) households used a borehole as the main water source and 219 (29.3%) households had a pit

latrine. 532 (69%) used paraffin candles as the predominant form of lighting. 349 (46%) households owned a television set or radio, 349 (25.0%) and 409 (53%) had a telephone. 748 (98%) sought treatment from health centre. Table 2 below provides a summary of this information.

We observed significant differences in the proportions of seeking healthcare, time to health facility, land ownership and predominant source of lighting. These services related positively to PSG. In contrast use of pit latrine and satisfaction with service provided by health facility was higher in the non-PSG group compared to PSG membership.

3.5 Associations between Parent Support Groups (PSG) and Integrated Outreach Services (IOS)

3.5.1 PSG and ANC including related services

The association between each of the four IOS outcomes and PSGs was investigated using chi-square tests by comparing PSG households and non-PSG households. For cross-tabulations with small counts for which the expected frequencies were less than 5, Fisher's exact test was used.

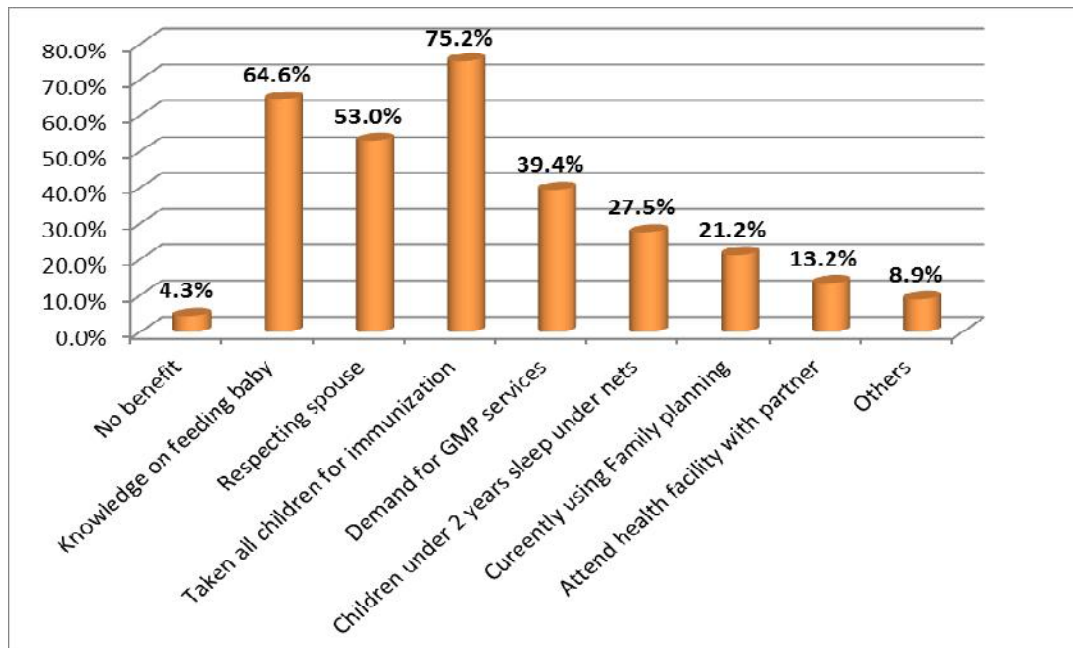


Fig. 6. Benefits of being a PSG member

Table 2. Household characteristics by percentages in PSG versus non PSG households

Characteristic	PSG n=302	Non PSG n=465	P- value
Household head			
Male	96	92	0.03
Female	4	8	
Water source			
Borehole	92	90	0.2
Water tap in house/public	0.3	0.2	
Spring/river/stream	0	1.3	
Rain water	7.0	8.0	
Other	0	0.6	
Latrine use			
Pit latrine¹			
Yes	24	31	0.03
Predominant lighting			
Firewood	2	3	0.01
Paraffin lantern	75	65	
Paraffin candle	23	32	
Household possessions			
Telephone	58	51	0.06
Radio/ Television set	47	45	0.4
Pair of shoes for each house member	74	64	0.01
Where seek treatment for general health care			
Hospital	2	0	0.04
Health centre	96	99	
Private clinic	0.2	0.3	
VHT	2	0.6	
Time to health facility			
<1hr	21	16	0.003
1-2hrs	52	40	
2-3hrs	25	40	
3-5hrs	3	3	
>5hrs	0	0.2	
Satisfaction with service at health facility			
Yes	41	57	<0.001
Land ownership			
Yes	99	95	0.02
No	1	5	
Don't know	0	0.2	

Table 3. Associations between PSG and ANC including related services

Variable	PSG Household		Non PSG Household		Chi square	P-value
	n	%	n	%		
Had at least 4 ANC visits?						
Yes	76.1	258	62.6	14.18	14.18	0.0002
No	68	23.9	154	37.4		
Ever heard of a birth plan?						
Yes	259	88.4	400	91.5	1.97	0.1608
No	34	11.6	37	8.6		
Had a birth plan for most recent delivery?						
Yes	257	99.2	388	97	3.75	0.0527
No	2	0.8	12	3		

Results from Table 3 show that 76.1% of the mothers in PSG households reported having sought antenatal care at least four times during their last pregnancy as compared to 62.6% in non-PSG households. Moreover, there was a statistically significant association between being in a PSG household and seeking antenatal care at least four times during the last pregnancy (p-value=0.0002).

When other services delivered during ANC visits were considered such as knowing what a birth plan is and having one for every pregnancy, as presented in Table 1, results indicated no statistically significant association between being in a PSG household and having heard of the term birth plan (p-value=0.1608) or having a birth plan for the most recent delivery (p-value=0.0527).

3.5.2 Assistance with birth plan preparation

Assistance in preparing the birth plan is always offered to the expecting mothers and such assistance is usually offered by different categories of people including VHTs, health workers, spouses, TBAs, relatives/friends and others. It was observed that, for nearly all the identified categories, the proportion of mothers reporting being assisted was higher in PSG

households than in non-PSG households. As shown in Fig. 7, 28% of mothers in PSG households reported being assisted by a VHT compared to 20% in non-PSG households. The proportion of mothers reporting to have been assisted by a health worker was similar (51%) in both PSG and non-PSG households while 51% in PSG households reported being assisted by their spouse compared to 49% in non-PSG households. Other categories of people mentioned by mothers in PSG households to have assisted them included fellow PSG members and mothers-in-law.

3.5.3 Growth monitoring and promotion services

Study results indicated a statistically significant association between being in a PSG household and accessing GMP services.

Monitoring child weight is taken as one of the key components of GMP and as shown in Table 4, study results showed a statistically significant association between being in PSG household and weighing of children (p-value=0.002). Proportionally, compared to 43.4% in non -PSG households, in PSG households, 65.9% reported having weighed their children at least once in the last two months prior to the study.

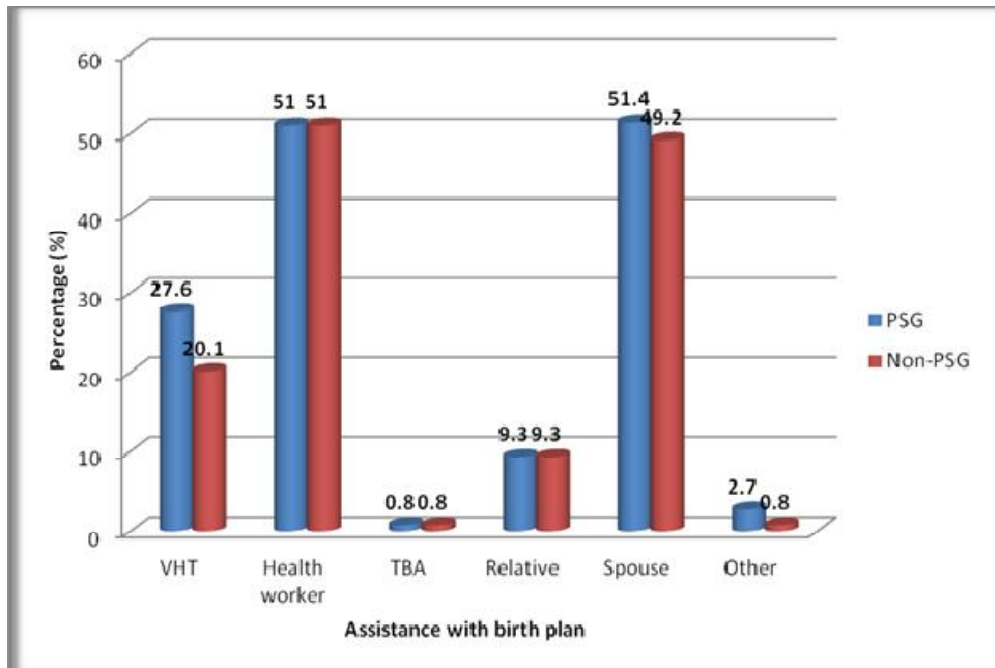


Fig. 7. Assistance with birth plan preparation

3.5.4 PSGs and male involvement in IOS activities

To assess male involvement in IOS, a number of issues were considered in this study which included men's involvement in child weighing, remembering of GMP appointments as well as supporting spouses with transport to take their children for GMP. Although the proportions of male involvement were generally low in both groups, better performance was observed in PSG households compared to non-PSG households. For instance the percentage of men getting involved in actual weighing of the child was 23% in PSG households compared to 10% in non-PSG households while in regards to men remembering GMP appointments, the percentage was 47% in PSG households compared to 36% in PSG households.

From the results presented in Table 5, there was an observed statistically significant association between a husband being in a PSG household and getting involved (or being present) in the actual weighing of their child (p-value <.0001). Additionally, results also indicated a statistically significant association between a husband being in a PSG household and remembering of GMP appointments.

3.5.5 PSGs and immunization coverage

Immunization coverage in PSG and non-PSG households was assessed by looking at children who had received measles vaccination and BCG vaccination. For measles vaccination only children who were 9 months and above and having a child health card were considered while for BCG all children were considered for analysis since it is given at birth. Most of the children in PSG households (90.3%) were found to have been immunized for measles and had a health card present while in non-PSG households 82.1% of the children had been immunized for measles.

Regarding BCG vaccination, almost all children in both PSG and non-PSG households had received the vaccination although the percentage was slightly higher in PSG households (99.6%) compared to PSG households (98%).

A statistically significant association was observed between being in a PSG household and having immunized the child for measles (p-value=0.0099). For BCG vaccination however, results indicated no significant association between being in a PSG household and having received BCG vaccination (p-value=0.0630) as shown in Table 6.

Table 4. Associations between PSGs and access to GMP services

Variable	PSG household		Non-PSG household		Chi square	P-value
	n	%	n	%		
Access to GMP services?						
Yes	301	99.7	435	93.5	17.68	<.0001
No	1	0.3	46	6.45		
Child weighed at least once in the last 2 months?						
Yes	199	65.9	202	3.4	9.59	0.002
No	103	34.1	263	56.6		

Table 5. Associations between PSG and male involvement in IOS activities

Variable	PSG household		Non-PSG household		Chi square	P-value
	n	%	n	%		
Involvement in child weighing						
Yes	70	23.2	46	9.9	25.18	<.0001
No	232	76.8	419	90.1		
Remembering GMP appointments						
Yes	141	46.7	165	35.5	9.59	0.002
No	161	53.3	300	65.5	7.77	0.0053
Transport support for GMP						
Yes	145	48.0	176	62.2		
No	157	52.0	289	37.8		

Table 6. Association between PSGs and Immunization (Measles and BCG)

Variable	PSG household		Non-PSG household		Chi square	P-value
	n	%	n	%		
Received measles immunization?						
Yes	186	90.3	257	82.1	6.66	0.0099
No	20	9.7	56	17.9		
Received BCG vaccine?						
Yes	296	98.0	463	9.6	-	0.0630
No	6	2.0	6	0.4		

4. DISCUSSION

About 75% of the study participants are below age 30, reflecting the young age structure of the Ugandan population. The levels of sanitation and hygiene remain relatively low, for example use of pit latrines. Differences in the level of satisfaction with healthcare services among PSG versus non-PSG groups may reflect higher knowledge levels leading to high expectations; better understanding of health service provision and utilization in the PSG group. We found that community health practices such as proportions seeking care in hospital or with VHTs were associated with PSG households although overall there is >95% access to care in a health facility. The level of access to health facilities corresponds to what has been shown in some studies in low income countries with emphasis on facility-based care and emergency obstetric care [6]. Whereas this has worked well, some MNCH services are best delivered at community level. We have shown that more access to VHTs and hospitals in PSG communities could reflect the potential for underutilization of some of the IOS services. This observation is also supported by some of the qualitative data.

Although there was an increase in IOS uptake in project areas, the levels are not all that impressive when compared to the ones recommended nationally or globally – there is still room for improvement, and VHTs have a key role to play in this. In relation to this, findings of a VHT Functionality Report [14] in Kitgum district showed that only 23% of VHTs were fully knowledgeable about their roles²; 49% had been trained for less than a week and 45% had been trained before 2010. Only 30% of these VHTs

had received refresher training in iCCM and 34% had not been supervised in the last quarter before the study was conducted. There were other issues, for instance some VHTs not knowing who exactly to report to and lacking adequate supplies to carry out their roles, which could partly explain health trends in Kitgum and also the concerns of mainstream healthworkers in the qualitative strand of study who were not entirely comfortable with VHT capacity.

A higher proportion of mothers completing at least four antenatal visits during their most recent pregnancy was observed in PSG households as compared to non-PSG households. In general the data available from surveys on this indicator usually do not specify with which provider, so receipt of care by any provider is measured. We also note that receipt of antenatal care does not guarantee the receipt of interventions that improve maternal care. It is likely that through the sensitization in PSGs, mothers are increasingly appreciating the importance of antenatal care for maternal and infant survival thus the higher uptake of ANC services in this group. Similarly, more PSG households were found to be accessing GMP services than non-PSG households. Such a result is expected as most PSG members had mentioned increased demand for GMP services as a result of their PSG membership. In fact there was an observed significant association between PSG membership and access to GMP services.

Immunization is one of the key interventions that have been proven effective in reducing infant mortality and as such timely vaccination is highly recommended. Our study results found that the proportion of children 9 months and above who had been immunized for measles was higher in PSG households compared to non-PSG households with a significant association being observed between being in a PSG household and having immunized the child for measles. However, for BCG vaccination which is

² VHTs roles include health education, home visiting, mobilization, referral, linking the community to health services, collection of data and maintaining records.

administered at birth, almost all the study children had been immunized with the proportions being similar (> 98%) for PSG and non PSG households. This could be explained by the ongoing mass immunization district campaigns and is one of the main components of IOS and its success.

In general, the results of this study showed that PSGs were significantly associated with most of the integrated outreach services. Although possible confounding factors were not fully accounted for in this study, the findings provide good insights on how beneficial PSGs are. These study findings can therefore be used as a basis for conducting further studies to assess the effect of PSGs on Integrated Outreach Services (IOS) as well as maternal and infant survival in general.

5. CONCLUSION AND RECOMMENDATIONS

The uptake of IOS was poor in the study area, and supported our explanations with HMIS data. Furthermore, the uptake was declining in some services; however we do not have information on the numbers who are in need of this service to fully describe trends and this seems to be the situation for the country data. One area of interest for policy makers would be cost effectiveness analysis, to determine costs associated with adding services to IOS per unit of outcome/s. Additional data for this would be required as it allows decision makers to choose between this (PSG) and other alternatives. The well-known gold standard for evaluating the effectiveness of any intervention is a randomized controlled trial (RCT) and this is what is recommended for World Vision Uganda's interventions.

CONSENT

All authors declare that written informed consent was obtained from the study participants for publication of this case report.

ETHICAL APPROVAL

The authors hereby declare that the study was examined and approved by the appropriate ethics committee and have therefore been performed in accordance with the ethical standards laid down in the 1964 Declaration of Helsinki.

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COMPETING INTERESTS

Authors have declared that no competing interests exist.

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