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Accuracy of maternal recall of birth weight and selected delivery complications in Zanzibar

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Abstract
Background: Birth weight is one of the key predictor for survival, health and future development of a child. In developing countries data on birth weights are limited to obtain due to difficulties in keeping records especially among rural women. Maternal recall of birth weight can therefore become a useful source of birth weight data. This study was carried out to determine recall of birth weight and delivery complications among mothers in Unguja West District of Zanzibar.
Methods: This cross-sectional study involved mothers who had children below five years of age. Pretested structured questionnaire was used to collect information on socio-demographic characteristics of the mother, age of the child, birth weight of the child and delivery complications. Other information was obtained from maternal antenatal clinic and child's growth monitoring cards.
Results: A total of 260 women were included in the study. The mean age of the mothers was 29 years, ranging from 17 to 45 years. More than half (62%) had attained secondary education and few had informal education (6.5%) or post-secondary education (12%). Majority of the mothers (85%) delivered at the health facility assisted by trained health care provider. Those who delivered at home (15%) were either assisted by a relative or Traditional Birth Attendant (TBA). Over three quarters (78.5%) of the mothers had birth weights of their children recorded in the postnatal care cards. Out of 38 children who were born at home, 87% (n = 33) were not weighed and there were 23 women (10.4%) who delivered at the hospital but their children's weight were not recorded. Overall, 46 (20%) mothers could not correctly recall birth weights of their children. There was strong correlation between recall and recorded birth weight (r^2=0.79; p<0.01). Reported/recorded delivery complications were hypertension, excessive bleeding, low birth weight, episiotomy, anaemia and preeclampsia.
Conclusion: Maternal recall can provide reliable information with regard to child's birth weight and delivery complications. Health facility staff should measure child's weight correctly, inform the mother and record in the child's card in order to facilitate correct recall by the mothers.

Keywords: recall, mothers, birth weight, delivery complications, Zanzibar

Introduction

Birth weight is one of the key predictor of survival, health and future development of the child. The incidence of low birth weight (LBW) which is defined as weight at birth of less than 2,500 grams has been selected as an important indicator for monitoring the major health goals by the World Summit for Children (UNICEF/ WHO 2004). In developing countries data on birth weight are very difficult to obtain, because most births occur outside health facilities, and many infants are not weighed at the time of birth, while those weighed at birth often are not given a formal record of birth weight or birth certificate (Islam, 2014). Accurate data on birth weights are important in epidemiological studies since both low birth weight and large for gestational age deliveries are always linked with increased risk for development of non-communicable diseases in future (Yang & Huffman, 2013; Smith *et al*., 2016).

According to the Tanzania Demographic and Health Survey (TDH-MIS, 2016), among all births in the 5 years preceding the survey, 60% of births in Tanzania were delivered at a health facility, and 64% were delivered by a skilled provider. In Zanzibar, the proportion of births that took place at health facilities ranged from 50% in Kaskazini Pemba to 81% in Mjini Magharibi (NBSZ, 2014). In 2010, 48% of all pregnant women gave birth at home, and 50% delivered in a

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health facility. The number slightly increased from 2005, when 47% delivered in a health facility with rural urban variations (NBS, 2011).

There have been several studies examining the accuracy of maternal recall of infant birth weight through comparison with information from medical records. The majority of these studies have shown that maternally recalled birth weight is a good proxy for recorded weight (Rice *et al*., 2007; van Gelder & Roeleveld, 2011). A study in Cameroon found that maternal recall was very poor (Mbuagbaw & Gofin 2010) while a study in Uganda reported moderate agreement between recorded and recalled birth weight (Lule *et al.* 2012). There are many literatures on the determination of accuracy of maternal birth weight in developing countries but comparatively little is known about whether women are aware and have enough accuracy of birth weight recall in Zanzibar. Correct recall of the previous birth is important for both clinical and epidemiological studies. This study aimed to determine the association between maternal recall and recorded birth weight and other delivery complications among women with children below five years in Zanzibar West in the United Republic of Tanzania.

Materials and Methods

Study area

This study was carried out in Zanzibar West District of Zanzibar Island. Zanzibar is divided into five administrative regions, three in Unguja and two in Pemba. Each region is subdivided into two districts, which make a total of ten districts. The lowest government administrative structure at the community level is the *Shehia*. According to 2012 census, the total population of Zanzibar was 1,303,569; with an annual growth rate of 3.1% (NBSZ, 2014).

Study design and sampling procedure

The study employed a cross-sectional design, which involved mothers with children below five years of age. The survey was carried out in March-April 2016. Two *Shehias* namely, Pangawe and Kiembesamaki were selected randomly. Mothers who had at least one under five child were included. The study excluded those who were not mentally stable and those who were seriously sick during the study. The sample size was determined under the assumption that most women who delivered at the health facility had higher chance of making correct recall of child's birth weight. According to TDHS 2015/2016, 80.8% of the women in Unguja West delivered in the health facility (TDH-MIS, 2016). Considering confidence level of 95% and response rate of 90%, the minimum required sample size was 236 women. Considering 10% of attrition factor, a total of 261 women were interviewed and complete data was analysed for 260 mothers.

Data collection

The primary data were collected by interviewing the mothers based on a structured questionnaire. The questions were geared to obtain information on demographic and socioeconomic characteristics of the mother. Other information sought was parity, place of delivery, delivery complications, child's birth date, birth's order and birth weight. Birth weight and delivery complications were also extracted from the clinic cards.

Data analysis

Data were entered and subjected to statistical analysis using Microsoft Excel Software (Microsoft office, 2010) and Statistical Package for Social Sciences (SPSS) Version 20 (SPSS Inc., Chicago, USA). Descriptive statistical analysis was done to obtain characteristics of the study population. For all continuous variables, means and standard deviation (SD) values were obtained while frequencies were presented for categorical variables. Association between recorded and recalled birth weights was done using correlation analysis.

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Ethical considerations

The study protocol was approved by Zanzibar Medical Research and Ethics Committee (ST/0002/MARCH/016). The research team obtained appropriate authorization from district and *Shehia* leaders. Participation to the study was voluntary and informed written/oral consent to participate was sought from the participants.

Results

Socio-demographic characteristics

A total of 260 mothers were included in this study. The mean age of the mothers was 28.8 years (SD 5.5), ranging from 17 to 45 years with majority (54.6%) falling under age category of between 26 and 35 years. Almost all (93.1%) the mothers were married. More than half (62.7%) of the interviewed respondents attained secondary education while 6.5% had no formal education; and 12.3% had professional training. Of the total participants, 50.5% were housewives, 31% were formal employees, 9% were traders, 7% were business women and 2.5% were students. Mean number of children was 3 (SD 2.01), ranging from one to ten children and their age ranged from 1 to 55 months (Table 1).

Table 1: Socio-demographic characteristics of the respondents

Variable	Response	Number	Percent
Mothers age (years)	≤ 25	85	32.7
	26 - 35	142	54.6
	≥ 36	33	12.7
Marital status	Married	242	93.1
	Single	3	1.2
	Divorced	15	5.8
Education level	Informal	17	6.5
	Primary	48	18.5
	Secondary	163	62.7
	Post-secondary	32	12.3
Source of income	Informal employment	137	52.7
	Formal employment	49	18.8
	Business	59	22.7
	Farming	15	5.8
Age of the child	≤ 11 months	197	75.8
	> 11 months	63	24.2
Number of children	One to two	126	48.5
	Three to four	82	31.5
	Five or more	52	20

Place of delivery

Most (85.4%) women delivered at the health facility. Those who delivered at home were assisted by a relative or a traditional birth attendant (TBA). About one third of the mothers said the reasons for giving birth at home were long distance to the health facility (38%) while others said it was culturally accepted (34%). Only three respondents (7.9%) reported sudden onset of labour or availability of qualified traditional birth attendants in the area as reasons for home delivery (Table 2).

Recall of birth weights

In total, 46 mothers (20%) could not correctly recall birth weights of their children, out of whom 57% underestimated and 43% overestimated birth weights. Overestimation ranged from 100 to 900 grams while underestimation ranged from 100 to 1,300 grams. Out of 38 mothers who delivered at home, 33 (87%) were not weighed and there were 23 mothers (10.4%) who delivered

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at the hospital but their children's weights were not recorded. In total, 225 women (86%) could report birth weight while 204 women (78.5%) had recorded birth weights.

Table 2: Distribution of place of delivery, reasons for home delivery

Variable	Response	Number	Percentage
Place of delivery	Home	38	14.6
	Health facility	222	85.4
Person assisted during delivery	Medical personnel	222	85.4
	Relative	29	11.2
	TBA	7	2.7
	No assistance	2	0.8
Child weighed immediately	Yes	221	85.0
	No	39	15.0
Reasons for home delivery (n=38)	Long distance to the health facility	14	36.8
	Culturally Accepted	13	34.2
	Poor services	5	13.2
	Sudden labour onset	3	7.9
	Availability of TBAs	3	7.9

More than 70% of the respondents had no complications. Reported/recorded delivery complications were hypertension, excessive bleeding, low birth weight, episiotomy, anaemia and preeclampsia. Most mothers could correctly recall delivery complications. However, most women reported to have had excessive bleeding compared to what was actually recorded in the cards (Table 3). Of the 222 women who delivered at health facilities, 10.4% of the child's birth weight were not recorded. On the other hand, of the 38 home deliveries, 33 (86.8%) had their birth weight not recorded.

Table 3: Percentage distribution of recall of birth weight and delivery complication

Variable		Recall		Recorded	
		n	%	n	%
Birth weight	<2.5 kg	40	17.8	36	17.6
	2.5 to 4 kg	182	80.9	166	81.4
	≥ 4 kg	3	1.3	2	1.0
Delivery complications	None	199	76.5	207	79.6
	Low birth weight	5	1.9	4	1.5
	Anaemia	3	1.2	3	1.3
	Complication associated with Caesarean delivery	25	9.6	26	10
	Excessive bleeding	12	4.6	5	1.9
	Preeclampsia	2	0.8	2	0.8
	Hypertension	7	2.7	6	2.3
	Episiotomy	7	2.7	7	2.7

Pearson correlation of recalled and recorded birth weight of the child was 0.89.This shows that the strength of association between these two variables was high, and the coefficient of determination (R^2) was 0.79 (p<0.001) (Figure 1).

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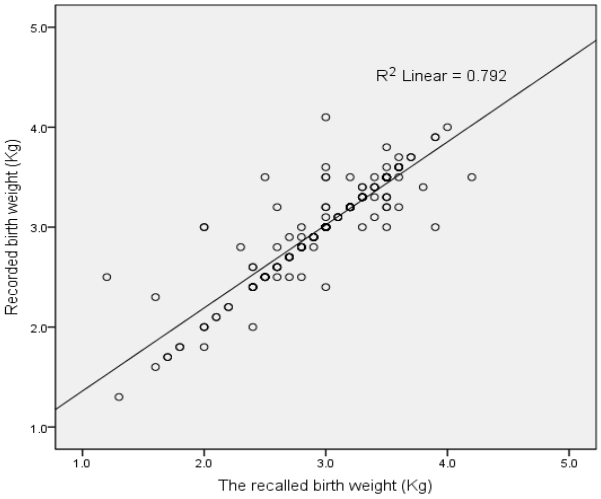

Figure 1: Correlation between recalled and recorded birth weight

Discussion

This study was conducted to assess how accurate mothers of children below five years can recall their children's birth weight and delivery complications. Most of the mothers could recall birth weight of their children and those who could not, it was because the child was born at home and taken to the clinic late where birth weight could not be determined. Majority of the children born at home were not immediately weighed hence their birth weights were missing. Surprisingly, about 10% of the children were born at the health facility but information on their weights at birth was missing in the postnatal clinic cards. This shows some negligence among health care providers. Another reason, which is rare could be loss of the clinic card with the initial information hence the new card will be missing some of the aspects. According to WHO/UNICEF, mothers whose babies are weighed may not remember their child's birth weight if it is not registered on a health card or birth certificate or if they were not informed orally (UNICEF/ WHO, 2004). This necessitates the recording of all the key information and the mother/care giver should be informed.

The Tanzania government encourage delivery at health facility as a strategy to increase access to skilled birth attendance and emergency obstetric care so as to reduce maternal and infant's death. This study observed that home delivery was relatively low in the area. This was lower than reported in other studies conducted elsewhere in Tanzania (Exavery *et al*., 2014; Kruk *et al*., 2015). Studies in Kenya also indicated higher home deliveries despite of high attendance to ante-natal care clinics (Lewis & Davey, 2013; Mondi *et al*., 2016). Some of the reasons given like physical distance to the health facility and sudden labour onset may be relevant but understanding the benefit of delivery at the health facility is important to change attitude of the mothers and other family members. In this study, the reasons given for home delivery were similar with those reported in other studies (Exavery *et al*., 2014; Mageda & Mmbaga, 2015; Choe *et al*., 2016). In Zanzibar, there are at least 158 health facilities while Unguja West District has only 18 health facilities and 29 *shehias* hence distance to the health facility may be a strong reason which was reported by most women in the study area. Other researchers observed that distance to the nearest health facilities, education, quality of antenatal care and sudden onset of labour were among the reasons for home delivery (Kruk *et al*., 2015; Choe *et al*., 2016). Although a number of women reported that there is no harm to deliver at home, it is important to educate them so that they can change their attitude.

There was no significant difference in mean of recalled and recorded birth weights. The correlation of recalled and recorded weights of 0.89 indicates that the strength of association between these two variables is very high, and that the correlation coefficient is highly significant.

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This means in absence of clinic card, maternal recall of birth weight of the child born in the past five years is reliable. Other studies elsewhere showed high correlation between recalled and recorded birth weight among children below five years (Walton *et al*., 2000; Rice *et al.*, 2007; Mbuagbaw & Gofin, 2010). Other studies reported moderate correlation (Lule *et al*., 2012; Islam, 2014). In a recent systematic review, agreement between recalled and recorded birth weight was found to be high (Shenkin *et al.,* 2017).

Complications associated with caesarean and excessive bleeding occurred more frequently whereas anaemia and low birth weight were the least reported. We did not observe much discrepancy between recalled and recorded delivery complications; hence information on previous birth may be collected from the mother through recall when the time lapse between the two births is less than five years. Caesarean delivery may cause effect on the mother such as placenta previa and sometimes may lead to maternal death (Solheim *et al.*, 2011) and for the baby it can cause cuts or nicks from the surgery tools, breathing problems, low Apgar scores and premature birth from an incorrect gestational age.

There are some study limitations that may limit the generalisation of our findings. This study was conducted in a small area in Zanzibar so results cannot be generalized to the whole country or to Tanzania mainland. The age of children that ranged from one month to 55 months may be too short so different results could be obtained if older children were included in the study.

In conclusion, birth weight recalled strongly associated with birth weight recorded. Birth weight recall is very important to trace the nutritional status of child and sometimes relate it to the future risk for non-communicable diseases. Hence, health facility staffs should measure it correctly, inform the mother and record in the child's card in order to facilitate mothers to recall it correctly. Likewise, recall of delivery complications were similar with what was recorded implying that recalled delivery information may be used in epidemiological studies when actual recorded information is missing. Mothers should be encouraged and educated in order to understand more about the benefits of health facilities delivery and risks for home delivery.

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