MASTER THESIS

Public Nutrition

2013

Breast feeding practices among Saharawi women in the Algerian refugee camps.

Marie Steffensen Lerseth

Faculty of Health Sciences

Department of Health, Nutrition and Management

OSLO AND AKERSHUS
UNIVERSITY COLLEGE
OF APPLIED SCIENCES

Table of Contents

ABBREVATIONS AND DEFINITIONS

AUC	Akershus University College
BFHI	Baby-friendly Hospital Initiative
BMI	Body Mass Index (kg/m^2)
ENA	Emergency Nutrition Assessment
HRW	Human Rights Watch
ILO	International Labor Organization
IYCF	Indicators for assessing infant and young child feeding practices
NCA	Norwegian Church Aid
NCHS	National Center for Health Statistics
NGO	Non Governmental Organization
NSCWA	The Norwegian support Committee for Western Sahara
ORS	Oral rehydration salts
REK	Regional Etisk Komite (regional ethical committee)
SPSS	Statistical Package for the Social Sciences
UN	United Nations
UNAIDS	The Joint United Nations Programme on HIV and AIDS
UNDP	United Nations Development Programme
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNFPA	United Nations Population Fund
UNHCR	United Nations High Commissioner for Refugees
UNICEF	United Nations Children's Fund
WFP	World Food Program
WHO	World Health Organization
WHS	World health statistic

LIST OF TABLES, FIGURES, PICTURES AND ATTACHMENTS

Tables

Figures

Pictures

Attachments

1. Application to REK
2. Questionnaire 1- Background information
3. Questionnaire 2- Breast feeding practises
4. Questionnaire 3- Iodine intake women
5. Questionnaire 4- Samples and measurements
6. Consent form

Acknowledgements

We are always told that the children are our future. It is the children that must continue the work to secure the future of our world and its inhabitants, yet they are one of the groups with the most nutritional and health challenges in the world today. Working with the adults of tomorrow and giving them a chance to break out of the downward spiral of poor health seems like the logical place to start. Because of the close relationship between Oslo and Akershus University College and the Saharawi ministry of health, I was somewhat familiar with the situation and the nutritional challenges in the Saharawi refugee camps. When I was presented with the prospect of working with breastfeeding practices in the camps, I was very exited. However, when working on this type of thesis, it is not uncommon to spend a fair bit of time in the area of interest. Regrettably, having two small children to care for I was not able to do so. It is possible that such an experience would have enabled me to better understand the cultural context around the issues discussed in this thesis. Nevertheless, having two tutors who have done a substantial amount of research in the area, I do feel confident that I have had the best possible guidance.

Caring for, and having recently given birth to, two small children, I dare allege that I do hold some valuable insight on the challenges motherhood and breastfeeding may offer. For me, experiencing the life-changing event of becoming a mother changed my perception of life; there now exist something that is more precious than my own life. This influences everything I do, my priorities and my ethical values. The change is difficult to comprehend to the full extent without having experienced it; however I do believe it to be similar for all mothers. This understanding is valuable when attempting to explain why mothers behave the way they do. Having said this, there is no doubt in my mind, that the role as a mother, under the extreme conditions in the camps, is far more demanding than mine.

Not being able to visit the camps myself, I would like to thank Navnit Kaur Grewal and Inger Aakre (also my co-tutor) for letting me use the data they worked so hard to collect. I am very grateful for being given the opportunity to work with something so close to my heart. This has made the entire process very meaningful to me. I would also like to give a special thanks to my tutor Sigrun Henjum for all the help and input on my work. Last but not least, I would like to direct a special thank you to my family for all the patience during the work with this thesis; without your support it would not have been possible.

Marie Lerseth

SUMMARY

Background: Optimal feeding of infants and young children living under difficult conditions are important to secure their development and survival. Refugees are a particularly vulnerable group. A previous study in the refugee camps in the Algerian desert, shows that prevalence of exclusive (11%) and predominant breastfeeding (47 %) was low among children <6 months. At the same time prevalence of stunting (21 %) and wasting (8 %) were high.

Objectives: To describe breastfeeding practices using the WHO indicators for assessing infant and young child feeding practices (IYCF) and other WHO recommendations. Further to explore possible differences in breastfeeding practices and prevalence of disease and breastfeeding practices and malnutrition.

Methods: Data from a survey conducted in 2010 were analyzed to explore breast feeding practices. Ninety-five lactating women and their 95 children under 6 months were included in analysis. Prevalence of exclusive and predominant breastfeeding was assessed using data collected trough 24-hour recall.

Results: Nine percent of the children in the study were wasted and 8 % were stunted. Two thirds of the children had been ill the previous two weeks, whereas 28 % with diarrhea and 36 % of other diseases. Sixty seven percent of the children were put to the breast within one hour of birth. Only 7 % of the children were exclusively breastfed, most of which were 0-1 months old (21 %). None of the children 4-5 months of age were exclusively breastfed. Nineteen percent of the children were predominantly breastfed, with prevalence declining with child's age. Seventy-four percent of the children were breastfed at least 6 times every day, and 99 % at least once a night. Most of the children (86 %) were breastfed on demand. Some of the children (22 %) were given prelacteal feeds. Three out of four were given water the previous day and 35 % were given infant formula. More of the girls ($p=0.04$) were breastfed frequently at night; the same were children with mothers that stayed at home ($p=0.02$). Children born into large households and/or households with many children were given less ($p<0.00$) prelacteal feeds and more were put to the breast within one hour of birth ($p<0.05$) than those in smaller households/fewer children.

Conclusion: Prevalence of wasting and stunting, although moderate by WHO cut offs, are alarming because of the children's young age. Poor breastfeeding practices and high prevalence of disease and under nutrition puts the children at risk of suffering lifelong consequences such as impaired mental and physical development or death. The children's health is likely to benefit by establishing breastfeeding practices that comply with recommendations.

1 Introduction

There is a general consensus, among health authorities around the world, that breastfeeding is the best way to feed infants (The World Health Organization [WHO], 2007). WHO and United Nations Children's Fund (UNICEF) recommends exclusive breastfeeding for the 6 first months of life and thereafter nutritionally adequate and safe complementary feeding with continued breastfeeding up to 2 years of age or beyond (WHO & UNICEF, 2007b).

Optimal feeding of young children is considered one of the single most important factors to secure children's health, growth and survival (UNICEF, 2007). Malnutrition increases the frequency and severity of infections, hence undernourished children are at greater risk of dying from common diseases. Moderate and severe wasting (acute under nutrition) and stunting (chronic under nutrition) in addition to poor breastfeeding practices are considered high risk factors (UNICEF, 2013). Of the estimated 9.5 million children below five years who died in 2006, one third was related to poor feeding and nutrition. Of these, 1.4 millions were estimated to be due to poor breastfeeding, particularly non-exclusively breastfed children, the first 6 months of life (WHO, 2009). Recent reports (UNICEF, 2013) show that in 2012, 6.6 million children under 5 years died. The most common causes of death were pneumonia (17 %), diarrhea (9 %) and malaria (7 %). Forty four percent of the deaths occurred within the neonatal period (within 28 days after birth). Even with this significant reduction in child mortality, the number of deaths related to under nutrition remains fairly unchanged, and are today a contributing cause to nearly half of the deaths. For the surviving children, poor nutrition early in life may lead to poor growth and intellectual development, which cannot be corrected later in life. It is estimated that 32 % of children in developing countries less than 5 years of age is stunted and 10 % is wasted (WHO, 2009).

The number of exclusively breastfed children under 6 months worldwide is low. Although increasing, in 2012 only 39 % of children were exclusively breastfed the first six months of life. The proportion of children who were put to the breast within one hour of birth was 42 % (UNICEF, 2013).

Refugees are particularly vulnerable group. The 165 000 refugees living in the Saharawi refugee camps in the Tindouf province, Algeria are completely reliant of food aid in order to survive. Even with the help of several international organizations, a number of nutritional challenges are seen, namely anemia, goiter, overweight in adults and malnutrition and infectious diseases in children (World Food Programme [WFP] & United Nations High

Commissioner for Refugees [UNHCR], 2007). A study by UNHCR & WFP (2011) in the Saharawi refugee camps found that the frequency of exclusive breastfeeding <6 months has deteriorated from 53 % in 1997, and was in 2010 only 11 %. The frequency of predominant breastfeeding <6 months decreased from 63 % in 1997, to 13 % in 2005, but rose back up to 47 % in 2010. Among the children under 6 months the prevalence of wasting, underweight and stunting were 8 %, 13 % and 21 % respectively (UNHCR & WFP, 2011). Living under such conditions, optimal infant and young child feeding is often difficult to achieve, particularly for the children old enough to receive complimentary foods. However for the children under 6 months that only require breast milk to thrive, it might be more feasible. Most mothers can breastfeed even if they are malnourished themselves (WHO, 2009).

While there are not many studies on breastfeeding practices among the youngest of the infants in Western Sahara and the refugee camps, comparable data from countries in the region such as Morocco, Mali, Niger and Senegal are available. The proportions of exclusively breastfed children under 6 months in these countries are 31 %, 38%, 14% and 34 % respectively. For the children age 4-5 months, only 10 % is exclusively breastfed in Morocco, in Mali 24 %, in Senegal 15 % and in Niger only 8 %. The proportion of children who were put to the breast within the hour of birth was 48 % in Morocco. Niger and Mali have similar numbers with 46 % and 44 % respectively. Senegal has much lower proportion of early initiated breastfeeding with only 22 %. The proportion of children who were predominantly breastfed were somewhat higher, in Mali 60 %, in Morocco 48 %, in Niger 84 % and in Senegal 64 % of the children (WHO & UNICEF, 2010).

During October-December 2010, an iodine study was conducted in four refugee camps. The focus of the investigation at the time was to map the iodine intake, iodine status (urinary iodine concentration) among lactating women and their children in the area in addition to studying thyroid function in the women. The study had a cross-sectional design, involving clinical samples of blood, urine and breast milk, analyzes of drinking water and animal milk in addition to a questionnaire concerning socioeconomic factors, intake of foods and drinks and breastfeeding practices. The study was intended as a baseline for a cohort.

Some of the material collected have already been described in two master thesis by Aakre (2011) with focus on iodine intake and status in women end children and Grewal (2011) focusing on iodine status and thyroid function. This thesis investigates the part of the material concerning breastfeeding practices among the children under 6 months using the WHO

Indicators for assessing infant and young child feeding practices (2007; 2010a; 2010b), and general WHO recommendations. The analysis will be based upon the original data collected in 2010.

1.1 Historical background and political situation in the area

In 1975, after nearly a century as a Spanish colony, Spain pulled out of the Western Sahara territory, with the intention of leaving the area as an independent state. Mauritania and Morocco did not agree to this and after some conflict between the two, Morocco ended up controlling most of the area from 1979. The rest of Western Sahara, a small area bordering to Mauritania is controlled by the Saharawi liberation movement, Polisario (Human Rights Watch [HRW], 2008). Sixteen years of conflict followed between Polisario and the Moroccan army until a ceasefire agreement put an end to it in 1991. A part of the ceasefire agreement was that there were to be held a referendum in order to decide whether Western Sahara should continue to be part of Morocco or gain their sovereignty. This referendum has still not been held (The Norwegian Support Committee for Western Sahara [NSCWA], 2007).

As a result of the conflict, more than 50 000 refugees were driven east towards the Algerian desert, forming refugee camps in the Tindouf area. Today, more than 30 years later the conflict is not yet solved. The estimated 165 000 refugees, still living in the area, are mainly depending of aid in order to survive (HRW, 2008).

1.2 Living situation in the camps

The areas in which the camps are located are in the middle of the desert, with temperatures ranging from 50˚C in the summer till freezing cold in the winter. There are a few social services available, including 6 years of mandatory schooling for all children. There are some countries offering scholarships to Saharawi students. Most of the households (59%) have no income (Norwegian Church Aid [NCA] & Akershus University College [AUC], 2005) and are dependent on food aid.

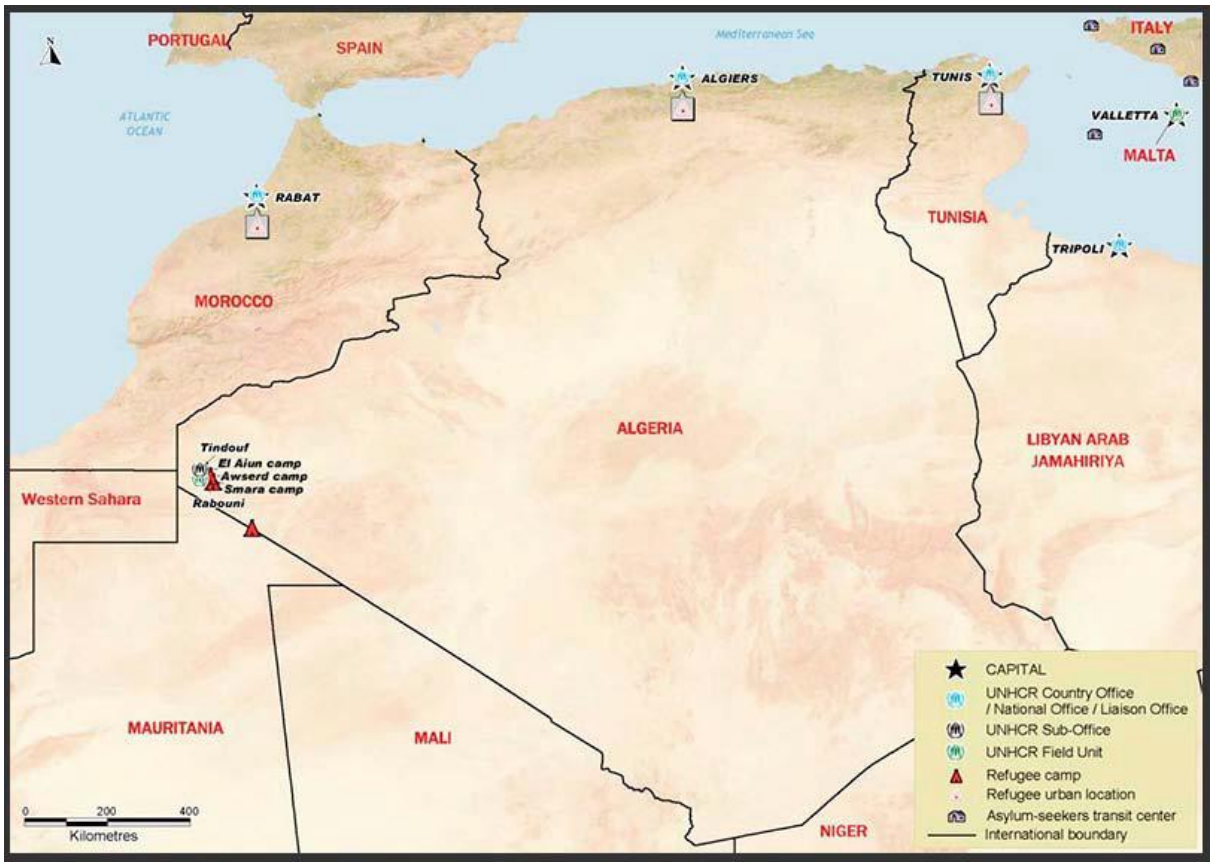

Figure 1 Map of North Western Africa and the Saharawi refugee camps.

Source: (UNHCR, 2011).

There is a limited production of own foods in the camps. Many household have at least two animals (goats and sheep). The wealthier families could have as much as 15 animals, although 44 % of the households have none (NCA & AUC, 2005). The animals are kept in separate enclosed areas in the camps, but are often fed leftovers and waste, which affects the quality of the milk and meat. A few of the households keeps poultry (8%), however most households get eggs distributed from a central producer. There are several gardening initiatives that aim to facilitate that each household can have their own vegetable garden, although the production is not yet sufficient (WFP & UNHCR, 2007).

The inhabitants receive international food aid from three main sources; World Food Programme (WFP), United Nations High Commissioner for Refugees (UNHCR), bilateral/ non-government organizations (NGO). The WFP ration covered in 2007 the minimum 2100 kcal requirement and included the following: 450 grams of cereals, 67 grams of pulses, 25 grams of vegetable oil and 30 grams of sugar (WFP & UNHCR, 2007).

Unfortunately, as a result of the financial crisis in the world the past few years, many countries have reduced their contribution considerably, worsening the nutritional situation among the inhabitants (NSCWA, 2007).

Picture 1 A Saharawi mother breastfeeding her child (used with permission from the woman). Photo: Inger Aakre

1.2.1 Nutrition situation in the camps

Several studies show great challenges when it comes to nutrition in the camps. There is a high prevalence of wasting (6-8 %) and stunting (30-40%) (NCA & AUC, 2005; UNHCR & WFP, 2011) and iron deficiency among children under the age of five (Soriano, Domènech, Mañes, Catalá-Gregori & Barikmo, 2011). The prevalence of wasting and stunting are generally decreasing, although peaks are observed some of the years. Anemia among the children aged 6-59 months are somewhat decreasing in severity and prevalence, but are still more than 50 %.

Studies suggest that as much as 23 % of the women were anemic (NCA & AUC, 2005). The high prevalence of goiter (Seal, Creeke, Gnat, Abdalla & Mirghani, 2006) is mainly due to

high levels of iodine in the drinking water (Henjum et al., 2010). There are also seen high proportion of overweight (35 %) and obesity (22%) among women in fertile age (NCA & AUC, 2005; Henjum, Barikmo, Strand, Oshaug, & Torheim, 2012).

1.2.2 Public health services

All the four camps have a hospital where inhabitants can receive treatment for minor injuries and conditions. More severe cases are sent to hospitals in Raboni and the city of Tindouf. Additionally, each of the districts within the camps has its own health administration and health center where pregnant women and mothers with young children can receive care. Despite this, a study show that as much as 71 % of the children are born at home (NCA & AUC, 2005). The local health center may also offer assistance in some other cases.

The United Nations (UN) millenniums goals aim to reduce the under- five child mortality by two thirds by 2015. Northern Africa has already reached this target, reducing the rate from 82 to 27 deaths per 1000 live births. Although the rates are decreasing, there is still a long way to go, especially for the youngest (under 1 month old infants) where the proportion of deaths is rising. Children in Northern Africa, born into poor families are also 2.1 times more likely to die before the age of 5 than those born into richer families (UN, 2012).

There is an overwhelming amount of research that shows the benefit of adequate breastfeeding practices, especially for those living under difficult conditions (UNICEF, 2013). Since malnutrition are so widespread among the children in the Saharawi refugee camps it is not unlikely that children in the camps are at risk of suffering developmental consequences or even dying due to poor nutrition. There is not a lot of research of breastfeeding practices among the children 0-2 years in the camps, even less among the youngest under 6 months. The recent UNICEF report (2013) shows that although considerably less children under 5 dies worldwide, the same trend is not seen among the infants, especially in the neonatal period. Therefore it is especially interesting to map the breastfeeding practices among the women and the youngest of the children and to understand the reasons why they breastfeed the way they do. This thesis aims to describe breastfeeding practices among the Saharawi women and their children. Further it explores possible differences between breastfeeding practices, prevalence of malnutrition and disease and the characteristics of the mothers, all in an attempt to identify factors that may explain differences in breastfeeding practices. Finally, it would be desirable

to be able to propose initiatives on how to improve the situation for the children, not to mention for the continuation of the research on the issue.

2 Theoretical background

Over the years, several initiatives have been proposed in order to improve the nutritional situation for children around the world (WHO, 2009).

In 1990, participants at the WHO/UNICEF policymakers meeting "Breastfeeding in the 1990s" initiated the innocenti declaration (1990) that aims to establish breastfeeding as the norm for feeding infants and young children, even in emergency situations. In addition it focuses on the risks of artificial feeding and possible consequences of it. It also emphasizes the mothers role in securing the children's development through empowerment and securing her health and nutritional situation. It states:

"…our vision is of an environment that enables mothers, families and other caregivers to make informed decisions about optimal feeding, which is defined as exclusive breastfeeding followed by the introduction of appropriate complimentary feeding and continuation of breastfeeding for up to two years of age or beyond" (WHO & UNICEF, 2007a).

Policies like the International Labour Organisation (ILO) Maternity Protection Convention 183, works to ensure all women around the world a minimum of 14 weeks maternity leave with partial pay. Additionally it aims to protect her from discrimination or redundancy because of her pregnancy as well as from having to perform work that can harm the child during pregnancy or nursing. Although only 23 of the 167 member states had ratified the latest convention (no. 183), it seems to influence their policies on maternity leave. For instance, 51 % of countries worldwide offer 14 or more weeks maternity leave, and only 14 percent offer less than 12 weeks (ILO, 2000).

To ensure that breastfeeding is facilitated from birth WHO and UNICEF (1991) launched Baby-friendly Hospital Initiative (BFHI) in 1991 (has since been revised). The initiative is a set of guidelines and frames on for intervention of different levels. Most countries have taken steps in order to implement the BFHI. In 2009, more than 20.000 hospitals in 156 countries were designated to the project.

The BFHI includes ten steps to successful breastfeeding:

Every facility providing maternity services and care for newborn infants should:

1. Have a written breastfeeding policy that is routinely communicated to all health care staff.
2. Train all health care staff in skills necessary to implement this policy.
3. Inform all pregnant women about the benefits and management of breastfeeding.
4. Help mothers initiate breastfeeding within a half-hour of birth.
5. Show mothers how to breastfeed, and how to maintain lactation even if they should be separated from their infants.
6. Give newborn infants no food or drink other than breast milk unless *medically* indicated.
7. Practice rooming in - allow mothers and infants to remain together - 24 hours a day.
8. Encourage breastfeeding on demand.
9. Give no artificial teats or pacifiers (also called dummies or soothers) to breastfeeding infants.
10. Foster the establishment of breastfeeding support groups and refer mothers to them on discharge from the hospital or clinic.

Source: WHO & UNICEF (2009).

After the fifty-fifth world health assembly in 2002, Global strategy on Infant and Young child feeding (WHO, 2002) was published. It builds upon previous work such as the Innocenti Declaration (UNICEF, 1990) and the Baby-Friendly Hospital Initiative (UNICEF, 1991).

The publication is a framework that aims to guide both research and development work on the matter and also to help countries to initiate appropriate measures to secure an optimal infant and young child feeding for all children including those living under difficult conditions.

The nine operational areas of the Global Strategy are:

1. Appoint a national breastfeeding coordinator, and establish a breastfeeding committee.
2. Ensure that every maternity facility practices the *Ten Steps to Successful Breastfeeding.*
3. Take action to give effect to the International Code of Marketing of Breast-milk Substitutes and subsequent relevant resolutions of the World Health Assembly.
4. Enact imaginative legislation protecting the breastfeeding rights of working women.
5. Develop, implement, monitor and evaluate a comprehensive policy covering all aspects of infant and young child feeding.
6. Ensure that the health care system and other relevant sectors protect, promote and support exclusive breastfeeding for six months and continued breastfeeding for up to two years of age or beyond, while providing women with the support that they require to achieve this goal, in the family, community and workplace.
7. Promote timely, adequate, safe and appropriate complementary feeding with continued breastfeeding.
8. Provide guidance on feeding of infants and young children in exceptionally difficult circumstances, which include emergencies and parental HIV infection.
9. Consider what new legislation or other suitable measures may be required to give effect to the principles and aim of the International Code of Marketing of Breast milk Substitutes and to subsequent relevant World Health Assembly resolutions.

Source: WHO & UNICEF (2009).

2.1 Indicators for assessing infant and young child feeding practices

WHO & UNICEF (2007a) have since developed a set of indicators in order to better assess, target, monitor and evaluate children's feeding patterns on a population basis. In 2008, WHO, UNICEF and partners published "Indicators for assessing infant and young child feeding practices (IYCF) part 1- Definitions"- The purpose of these indicators was to offer simple, reliable indicators for assessing feeding practice of young children. The publication "Indicators for assessing infant and young child feeding practices part 2"- measurement" (2010a) offer instructions and guidance on how to use the indicators. Indicators for assessing infant and young child feeding practices part 3- country profiles (2010b) presents data regarding 13 of the indicators from different countries.

There are 8 core indicators and 7 optional indicators in the publication, many concerning adequate complimentary feeding from six months and the continuation of breastfeeding until the age of two. The indicators are:

Core indicators:

1. Early initiation of breastfeeding
2. Exclusive breastfeeding under 6 months
3. Continued breastfeeding at 1 year
4. Introduction of solid, semi-solid and soft foods
5. Minimum dietary diversity
6. Minimum meal frequency
7. Minimum acceptable diet
8. Consumption of iron-rich or iron-fortified foods

Optional indicators:

9. Children ever breastfed
10. Continued breastfeeding at 2 years
11. Age-appropriate breastfeeding
12. Predominant breastfeeding under 6 months
13. Duration of breastfeeding
14. Bottle feeding
15. Milk feeding frequency for non-breastfed children

2.2 The breast milk and the benefits of breastfeeding

A newborn should be given to the mother immediately after birth, and breastfeeding should be initiated within one hour (WHO & UNICEF, 2009). Children who initiate breastfeeding within the hour are considerably more likely to survive the first two days of life than those who started later (Edmond et al., 2006). The child should be kept close to the mother after birth, and offered the breast frequently and breastfed on demand (WHO & UNICEF, 2009) and at lest 8 times daily (day and night). This stimulates the milk production and ensures that

the child is properly nourished (UNICEF, WHO, UNESCO, UNFPA, UNDP, UNAIDS, WFP & the World Bank, 2010).

Breast milk is the best and safest food for infants under the age of 6 months (WHO, 2009). It is easily digested and contains antibodies transferred from the mother. Maternal antibodies in breast milk have a protective effect against virus infections (Sadeharju et al., 2007) and bacterial infection (Van de Perre, 2003). The colostrum (the milk expressed for the first few days after birth) is especially rich in nutrients and antibodies and is particularly valuable for the child (UNICEF, WHO, UNESCO, UNFPA, UNDP, UNAIDS, WFP & the World Bank, 2010).

Studies show that exclusive breast feeding during the first 6 months of life covers the nutritional needs (WHO, 2002) and the need for fluids (Sachdev, Krishna, Puri, Satyanarayana & Kumar, 1991) of the majority of children. There are a few exceptions. Brest milk contains little vitamin D. Thus exclusively breast fed children runs a risk of developing rickets if not exposed to sunlight. The content of vitamin A and B_6, is also highly dependent of mothers status. Zink and iron content might be insufficient for children born too prematurely to have developed their endogenous stores of the nutrients. Even so, there is a general consensus that the benefits of breastfeeding outweigh the risks (WHO, 2002).

Breastfeeding may facilitate cognitive development and breastfed children on average score higher on intelligence tests than non-breast fed children. This difference is even greater in children with low birth weight (Anderson, Johnstone & Remley, 1999). Studies also suggest that breastfed children have a lower risk of obesity (Harder, Bergmann, Kallischnigg & Plagemann, 2005), cardiovascular disease due to factors such as high blood pressure (Martin., Gunnell & Smith 2005), high cholesterol levels (Owen, Whincup, Odoki, Gilg, & Cook, 2002) and atherosclerosis (Martin et al., 2005).

For the mother, benefits such as lower risk of post-partum hemorrhage (Chua, Arulkumaran, Lim, Selamat & Ratnam, 1994), ovarian- (Robenblatt & Thomas, 1993) and breast cancer (Collaborative Group on Hormonal Factors in Breast Cancer, 2002) are associated with breast feeding.

2.3 The risk of infectious diseases and under nutrition

The prevalence of malnutrition and disease is often unequally distributed between groups of different socioeconomic background. Such socioeconomic factors could be age, gender, ethnicity, education, income, work, living situation and the like (Gwatkin, 2000; Zere & McIntyre, 2003). For example, stunting is most prevalent among the poorest children living in rural areas (WHO, 1997) likewise are 81 % of the wasted children in the world living in South Asia or sub-Saharan Africa (UNICEF, 2013).

Under nutrition during the first two years of life can lead to stunting and wasting and consequently to reduced mental and physical capacity later in life. Delayed development during this time cannot be made up for later in life, thus making proper feeding during this time even more crucial (WHO, 2009). In areas where children are living under poor socioeconomic standards, stunting prevalence starts to rise around the age of three months (WHO, 1997), although some studies suggest that stunting occurs already from early infancy (Shrimpton, 2001) and even in utero (Dewey & Begum, 2011). Later in life, stunting could again have consequences for the next generation. Women that were malnourished as children, typically grows up to become stunted adults (Martorell, Habicht & Rivera, 1995) have impaired reproductive capacity, they are at risk of having more complicated births and their children lower birth weight (Victora, de Onis, Hallal, Blössner & Shrimpton, 2010) .

It is estimated that in the developing world 32% of children are stunted, and 10 % wasted (WHO, 2009), and that in Northern Africa in 2012, 6 % of the children under five years were underweighted (UN, 2012). In countries such as Mali, Morocco, Niger and Senegal, between 10 % and 40 % of the children under five years were underweight and 20 % to 55 % of the children were stunted (WHO & UNICEF, 2010). Similar numbers were observed in the Saharawi refugee camps among the children under 6 months, where 14% of the children were wasted and 23% were stunted (Aakre, 2011).

Premature introduction of complimentary feeding may lead to under nutrition, since the complimentary feeding or liquids often have lower nutritional density than the breast milk it replaces (Hop, Gross, Giay, Sastroamidjojo, Schultink & Lang, 2000). Additionally, when complimentary foods are given it causes the child to suckle less, leading to a decrease in milk production. This is particularly disadvantageous during the first days after birth when it is important to establish good breastfeeding routines (UNICEF, WHO, United Nations Educational, Scientific and Cultural Organization [UNESCO], United Nations Population

Fund [UNFPA], United Nations Development Programme [UNDP], The Joint United Nations Programme on HIV and AIDS [UNAIDS], WFP and the World Bank, 2010).

Giving complimentary foods or liquids before the age of 6 months can lead to infectious diseases such as diarrhea (Khadivzadeh & Parsa, 2004). Unsanitary conditions and unclean feeding equipment may cause transmission of other infectious diseases to the vulnerable infant. Children in developing countries are 6 (WHO, 2000) to 10 (Bahl et al., 2005) times more likely to die during the first months of life if not breastfed, in particular due to diarrhea (De Zoysa, Rea, & Martines, 1991) and pneumonia (Bachrach, Schwarz & Bachrach, 2003). Those only partially breastfed are 5 times more exposed than the exclusively breasfed. Prelacteal feeding (any foods or liquids given before breastfeeding is initiated) itself elevates the risk of neonatal death by 60 % (Edmond et al., 2006). According to WHO (2009) intervention leading to optimal breastfeeding and complementary feeding could reduce deaths in children under five years by 13 % and 6% respectively.

All these factors put together may lead to a downwards spiral of deteriorating health situation among the refugees. It is therefore critical that mothers receive the necessary help and education in order to break out of the situation. The prevalence of exclusive breastfeeding is low and malnutrition high in the camps. Knowing how dramatically good breastfeeding practices improves child health and survival; it may seem that much is to be gained by improving the breastfeeding practices among the mothers.

3 Objectives

This thesis aims to describe breastfeeding practices among Saharawi women and their children living in four refugee camps in the Tindouf area and the specific objectives are:

1. To describe breastfeeding practices among Saharawi children using the WHO indicators for assessing infant and young child feeding practices.

   Describe the frequency of the following indicators:

   - breastfeeding initiation within 1 hour of birth
   - exclusive breastfeeding
   - predominant breastfeeding

2. To describe other breastfeeding and feeding practices among Saharawi children, in comparison with WHO recommendations.

   Describe the frequency of children who were:

   - breastfed frequently during the day and night
   - breastfed on demand
   - given prelacteal feeds
   - given other foods the previous 24 hours

3. To explore differences between breastfeeding practices and the:

   - mothers knowledge of appropriate breast feeding
   - household composition
   - mothers age, education and work situation
   - child's gender and age
   - prevalence of under nutrition, stunting and wasting
   - prevalence of diarrhea and other diseases

4 Methods

4.1 Sample

The total population in the camps are approximately 165 000 people, of which 124 960 falls under the category vulnerable refugees. These are the target population for this study.

4.1.1 Sample size

The sample size for the original survey was based on a prevalence of goiter among women in the area (18 %) and calculated using the software Epi Info Statcalc, with a statistical power of 80 % and 5 % margin of error. This indicates that 100 women and 100 children are needed. However the risk of dropouts was considerable and it was decided to add 10 % to the final sample. This gave a final sample of 110 women and 110 children. In order to represent each of the four camps and their districts according to number of inhabitants, lists over population figures in each area were obtained from organizations such as UN, Polisario and Red Crescent. The estimation of number of inhabitants indicated 39 women and 39 children from the Smara camp, 25 from Auserd, 15 from Dajla and 31 pairs from Aaiun. As there were no complete lists of women that had recently given birth, random lactating women and their children were selected in each camp and district. For further description of sample and sampling procedure see Aakre (2011).

4.1.2 Sampling procedure

To qualify for inclusion in the study the children had to be between 0-6 months of age. The women had to be breastfeeding their children and also be willing/able to give a breast milk sample. Figure 2 illustrates the sampling procedure of the participants where 149 lactating women and their children less than 7 months old were invited to participate in the study. Of these, 6 refused to participate, 17 were excluded since they were not lactating and 16 had children that had turned 7 months hence not meeting the inclusion criteria. Further 3 participants were excluded at a later time when the children turned out to be too old. Two new participants were added to the sample. Study sample consisted of 109 women, one of which was later excluded from analysis when not able to produce a breast milk sample. Adding 2 participants from the pilot, the original study sample consisted of 110 women and children. The original data also included children between 6 and 7 months. Since this thesis aims to use the IYCF indicators (excusive breastfeeding under 6 months and predominant

breastfeeding under 6 months) the children between the age of 6 and 7 months were excluded, leaving a final sample of 190 participants, 95 women and 95 children.

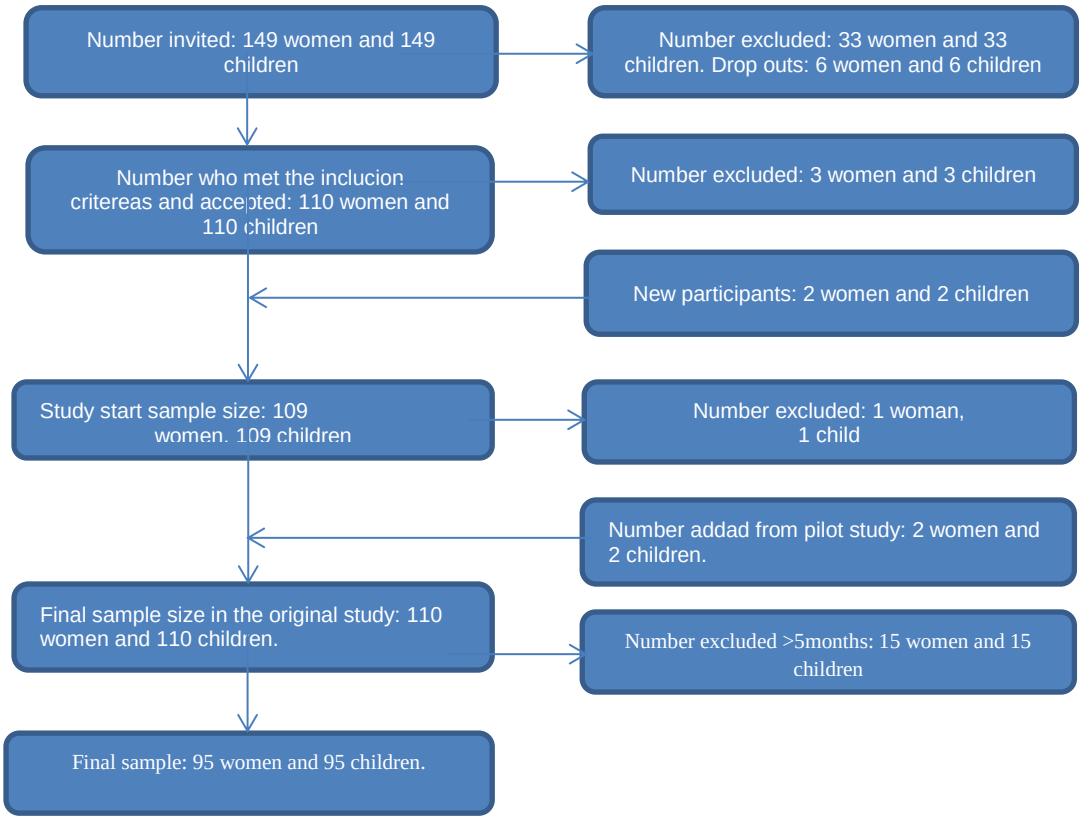

Figure 2 Flowchart of sampling procedure.

4.2 Field work

The research crew developed a research protocol in English (Aakre, 2011) and Spanish before leaving Norway. They also brought the necessary equipment from Norway. Two local fieldworkers, two bio- engineers, a doctor and a translator were recruited from the Saharawi Ministry of Health and trained according to protocol (Aakre, 2011). A pilot was conducted before starting the study.

The women included were given the necessary equipment with the appropriate instructions on how to use them the night before the data collection. The following day the team of field workers would visit them in their home, collecting samples and anthropometrical data. The questionnaires were completed by interviewing the women on their local language. For further description of training of the team and fieldwork, see Aakre (2011).

4.3 Questionnaires

The master students, Aakre and Grewal developed four questionnaires. Table 1 lists the variables relevant for this thesis. Questionnaire 1 describes background information such as woman's household situation and living conditions. Questionnaire 2 addresses intake of foods and drinks among the children. They use a combination of 24 hour recalls and 7 day food frequency questionnaire. There are also questions about background information of the child. Questionnaire 3 concerns the woman's intake of foods and drinks using 24 hour recalls and 7 day frequencies. Questionnaire 4 contains information of the anthropometrical measurements of both women and children. See attachments 2-5 for complete questionnaires.

Table 1 Variables used in this thesis.

Questionnaire:	Continuous:	Categorical:
1	-Age -Number of people in household -Age of head of household -Number of children alive -Number of children diseased	-Civil status -Education level -Work situation -Gender of head of household
2	-Age of child -Breastfeeding frequency night -Breastfeeding frequency day -Other food given to the child -Child's age when introduced to complimentary food -Age of child when mother plans to stop breastfeeding	-Gender of child -Birth place -Diarrhea -Other disease -Breastfeeding initiation -Foods given before the initiation of breast feeding -Health controls during pregnancy -Breastfeeding practices
3	-24 hour recall	
4	-Child's height -Child's weight -Mother's weight -Mother's height	

4.4 Tools for determining nutrition status in women and children

4.4.1 Body mass index categories in women

The women's nutritional status was calculated using the WHO body mass index (BMI) criteria (WHO, 2011). These categories divide BMI scores into the following categories:

1) Underweight: BMI <18.50.
2) Normal weight: 18.50-24.99.
3) Overweight: BMI 25.00-29.99.
4) Obesity: BMI ≥30

4.4.2 Z-scores classifications in children

The children's z-scores were calculated using Smart for Emergency Nutrition Assessment (ENA)("ENA software", 2009).The calculation of z-scores uses the formula:

$$\mathbf{z = (x - \mu) / \sigma}$$

where x= the individuals weight

μ=mean weight in population

σ= standard deviation in the population

Population reference is WHO child growth standards (2005).

World health statistic (WHS, 2010) defines of categories of under- and overweight among children as:

- **underweight:** proportion of children less than 5 years of age with weight for age < -2 z-scores of the median WHO child growth standards.
- **stunting:** proportion of children less than 5 years of age with length or height for age < -2 z-scores of the median WHO child growth standards.
- **wasting:** proportion of children less than 5 years of age with weight for height < -2 z-scores of the median WHO child growth standards.
- **overweight:** proportion of children less than 5 years of age with weight for length or height > +2 z-scores of the median WHO child growth standards.

Scores between <-2 –3 are considered moderate, while z- scores <-3 are considered severe in all groups of malnutrition. Definitions retrieved from WHO and UNICEF (2010).

WHO has defined cut off levels on how to evaluate the severity of the prevalence of malnutrition in a population. The cut-off levels are described in table 2.

Table 2 WHO classification for assessing severity of malnutrition by prevalence ranges among children under 5 years of age.

Indicator	Severity of malnutrition by prevalence ranges (%)			
	Low	Medium	High	Very high
Stunting	<20	20-29	30-39	>=40
Underweight	<10	10-19	20-29	>=30
Wasting	< 5	5-9	10-14	>=15

Source: WHO (1997)

4.5 Tools for determining breastfeeding situation

In order to measure the breastfeeding situation in the camps, the following tools are applied to analyze the data.

4.5.1The WHO indicators for assessing infant and young child feeding practices

As this thesis concentrates on children under six months, indicator 1- early initiation of breastfeeding, 2- exclusive breastfeeding for the first six months and 12 - predominant breastfeeding for the first six months, are relevant for use in the evaluation. Table 3 describes the relevant indicators (see page 15 for complete list).

Indicator 1, early initiation of breastfeeding is based on recall. Originally this indicator includes all the children born in the last 24 months, including diseased children. Note that in this study, only data from living children are available. The prevalence is calculated dividing number of positive answers by the total number of children in the study (WHO & UNICEF, 2007a).

Indicator 2, exclusive breastfeeding is based on 24-hour recall. The number of exclusively breastfed children is divided by the total number of children in the study. The criteria for inclusion are for the child to only have received breast milk, either by nursing, from a bottle/cup or from a wet nurse. Additionally to the breast milk, the child is allowed to receive oral rehydration salts (ORS), drops, vitamins, minerals and medicines (WHO & UNICEF, 2007a).

These results are based on a selection of children of different ages under 6 months. The results will reflect the proportion of children being exclusively breastfed at the age they are at the time of the data collection. The breastfeeding frequencies are typically higher just after birth, and gradually declining as the child gets older (WHO & UNICEF, 2010b). It is important to bear in mind that the high proportion of breastfed children among the youngest participants may increase the average for the group as a whole, and does not reflect the proportion of children being exclusively breastfed until just before they turn 6 months. In order to give a clearer picture of the distribution, data should ideally be disaggregated into age groups: 0-1 months, 2-3 months, 4-5 months and 0-3 months. The results within the group 4-5 months will give a better indication of how many children that are exclusively breastfed until they turn 6 months (WHO, 2008). The material used in this thesis is disaggregated and results of frequencies presented. Unfortunately the frequencies were too small to be further analyzed towards influencing factors (objective 3).

Indicator 12, predominant breastfeeding is calculated like the prevalence of exclusive breastfeeding. The inclusion criteria are the same, but also allows the child to receive water and water-based drinks, fruit juice and ritual fluids (WHO & UNICEF, 2007a).

Table 3 Description of relevant WHO indicators for assessing infant and young child feeding practice.

Indicator	Description	Criteria for inclusion	Calculation	
			Nominator	Denominator
1. Initiation of breastfeeding	Proportion of children born in the last 24 months who were put to the breast within one hour of birth.	Based on recall, includes living and diseased children.	Children born the last 24 months who were put to the breast within one hour of birth	Children born the last 24 months
2. Exclusive breastfeeding	Proportion of infants 0-5 months of age who are fed exclusively with breast milk.	Require the infant to receive breast milk (including expressed milk or from a wet nurse). Also allows the infant to receive ORS, drops, syrups (vitamins, minerals, medicines).	Infants 0-5 months of age who received only breast milk during the previous day	Infants 0-5 months of age
12.Predominant breastfeeding	Proportion of infants 0-5 months of age who were predominantly breastfed.	Require the infant to receive breast milk (including expressed milk or from a wet nurse), as the predominant source of nourishment. Also allows certain liquids (water and water-based drinks, fruit juice) ritual fluids and ORS, drops, syrups (vitamins, minerals, and medicines).	Infants 0-5 months of age who received breast milk as the predominant source of nourishment during the previous day	Infants 0-5 months of age

4.5.2 Additional WHO recommendations used as indicators.

In addition to the Indicators for assessing infant and young child feeding practices (WHO & UNICEF, 2007a; WHO & UNICEF, 2010a; WHO & UNICEF 2010b) there are other recommendations on infant feeding like the baby-friendly hospital initiatives' *Ten Steps to Successful Breastfeeding* (WHO & UNICEF, 2009). These are used to further measure the breastfeeding practices among the Saharawi women. The additional recommendations are described in the background section, and table 4 summarizes how they apply as indicators.

Indicator A & B, breastfeeding frequencies day and night, a cut off at 5 times was used, and relevant data were collected using 24- hour recall. Number of positive answers was divided on total number of children in the study for breastfeeding frequency prevalence.

Indicator C, breastfeeding on demand, possible answers in the survey were "yes", "no" or "both". Since there were no "both" answers, the prevalence is calculated simply by dividing positive answers with the total count of children. The data are based on recall.

Indicator D, prelacteal feeds, was based on recall. The number of positive answers was divided on total number of children in the study. The term "prelacteal feeds" in this context refer to any foods or liquids with the exception of the ORS, drops, syrups (vitamins, minerals and medicines) given before breastfeeding is initiated.

Indicator E, foods given the previous day, was based on 24- hour recall. The number of positive answers was divided on total number of children in the study. The term "foods" refers to any foods or liquids with the exception of the ORS, drops, syrups (vitamins, minerals and medicines).

Table 4 Additional recommendations used as indicators for assessing feeding practices among Saharawi children.

Indicator	Description	Calculation	
		Nominator	Denominator
A) High breastfeeding frequency DAY	Proportion of children who were breastfed >5 times per day. Based on a 24 hour recall.	Infants who received breast milk >5 times per day	Infants 0-5 months of age
B) High breastfeeding frequency NIGHT	Proportion of children who were breastfed >5 times per night. Based on a 24 hour recall.	Infants who received breast milk >5 times per night	Infants 0-5 months of age
C) Breastfeeding on demand	Proportion of children who were breastfed on demand. Based on recall.	Infants who were breastfed on demand	Infants 0-5 months of age
D) Prelacteal feeds	Proportion of children who were given other foods before the initiation of breastfeeding. Based on recall.	Infants who were fed additional food before the initiation of breastfeeding	Infants 0-5 months of age
E) Foods given the previous 24 hours	Proportion of children who were given other foods the previous day. Based on 24- hour recall.	Infants who were fed additional foods the day before the data collection	Infants 0-5 months of age

4.6 Determining mothers breastfeeding knowledge

Mother's knowledge of breastfeeding recommendation is determined by comparing their answers in the questionnaires. Their answers on how long they intend to breastfeed, and when they intend to introduce complimentary feeding will be compared to the data collected in the 24 hour recalls. This may revel if there is consistency between the two, indicating whether the mother has a correct understanding of accurate infant feeding or not.

4.7 Ethical considerations

Participants in the original study gave their informed consent to participate (attachment 6), and the study was performed according to the latest version of the Helsinki declaration (revised on the latest general assembly in 2008). See attachment 1 for Regional etisk kommite (REK) approval.

This thesis does not involve direct contact with the participants. There are no necessary precautions to take in handling the material, as it does not contain any information connecting it to the participants.

Should this thesis produce findings that affect the participant's health and wellbeing, such findings will be communicated to the local health authorities.

4.8 Data Processing and Statistical analyses

Most of the continuous variables and some categorical variables were transformed into new categorical variables. Table 5 shows the old and new variables, values and categories behind the results in this thesis. Most of the variables were simply recoded. The questionnaires did not contain questions concerning exclusive or predominant breastfeeding. In order to determine the prevalence of these, the 24-hour recall was used. The recall had recorded everything that the child had eaten, and by considering the amount of children that had received foods or drinks (water and water based drinks were allowed for predominant breastfeeding), the prevalence of exclusive and predominant breastfeeding were calculated. The women's *fluid intake* had to be calculated by adding up all the fluids asked for in interviews.

When received, the data were already entered into the statistic analytical software *Statistical Package for the Social Science*s (SPSS), version 14.0. The variables were tested for normal

distribution by Saphiro-Wilks test of normality. Data were considered normal distributed with significance level of > 5%, and ≤5% for non normal distribution. The normal distributed variables were those containing data of age for women and children, weight, height and BMI for women, weight-for-age for children and number of children dead, alive and <5 years. Because of the limited amount of data, the variables was merged into categorical variables (except for use in background characteristics of women and children), and/or recoded into variables more fit for analysis. Since all the variables used for analyzing differences between groups were categorical, bivariate cross tables were used, and chi-square tests were used to determine significance. Significance level were set to ≤0.05.

Table 5 Old variables, recoding process into new variables and cut off values.

Old variable	New variable	Process	Cut offs/new categories
WOMAN			
Age	Age woman, younger/older	Recode	≤ 29 years, > 29 years
Education level	High/low education	Recode	>9 years, ≤ 9 years
Number of children alive	Few/many children	Recode	1-2, ≥3,
Number of children diseased	Women with diseased children	Recode	Yes/No
Health controls during pregnancy	Attended health controls during pregnancy	Recode	Yes/No
CHILD			
Age	Younger/older children	Recode	0-2,3-5 months/ 0-2, 3-4, 5-6 months
FEEDING			
Type of foods given before the initiation of breast feeding	Prelacteal feeds	Recode	Yes/No
Breastfeeding initiation	Breastfeeding initiation before 1 hour	Recode	Yes/No
Breastfeeding frequency night	Breastfeeding times/night	Recode	≤ 5 & > 5
Breastfeeding frequency day	Breastfeeding times/day	Recode	≤ 5 & > 5
Other food given to the child	Exclusively breastfed & Predominantly breastfed	Children given foods excluded by selecting negative answers (0) in the *if*- function	Yes No
Child's age when introduced to complimentary food	Child's age when introduced to complimentary food grouped	Recode	0-2, 3-4, 5-6, 7-8, 9-10 & 11-12
Age of child when mother plans to stop breastfeeding	Age of child when mother plans to stop breastfeeding grouped	Recode	11-12,13-14,15-16,17-18,19-20,20-21 &22-24
HOUSEHOLD			
Number of people in household	Small/larger household	Recode	≤ 6, > 6

5 Results

5.1 Sample characteristics

Table 6 describes the background information of the women in the sample. The women were between 18 and 50 years of age. They had a mean BMI of 27 kg/m^2. According to the WHO BMI classification groups, 3 % were underweight, 28 % had normal weight, 46 % were overweight, and 22 % were obese. Average fluid intake was 1978 ml/day. They had on average 3.2 living children of which 1. 6 were under the age of five. Fifteen percent of the women had lost one or two children, which gives a mortality rate of 7 % for the study population.[1] Thirty percent had 6 years or less education, 46 % had 7-9 years education and 24 % had ten years or more. All of the women were married. Most of the women (90 %) had attended health control during pregnancy.

Table 6 Background characteristics of the Saharawi women (n=95).

Background characteristics, women (n=95)	
Age, years (mean (min-max) SD))	32.0 (18-50) 5.7
Weight, kg (mean (min-max) SD))	66.0 (36.9-95.5) 11.9
Height, cm (mean (min-max) SD))	156.3 (144.7-167.1) 5.7
BMI, kg/m^2 (mean (min-max) SD))	27 (17-41) 4.7
<18,5, % (n)	3 (3)
18,5-25, % (n)	28 (27)
>25-30, % (n)	46 (44)
>30, % (n)	22 (21)
Fluid intake, ml (mean (min-max) SD))	1978 (304-6557) 1092
Children	
live children (mean (min-max))	3,2 (1-10)
children <5 years (mean (min-max))	1,6 (1-3)
women with diseased children, % (n)	15 (14)
Education, years	
≤6, % (n), % (n)	30 (28)
7 -9 years, % (n)	46 (44)
≥10 years, % (n)	24 (23)
Married, % (n)	100 (95)
Health control attendance, % (n)	90 (86)

[1] Child's age at time of death is unknown. Mortality rate includes deaths at any time during childhood as stated by women.

The background information of the children in the sample is described in table 7. The sample consisted of 34 boys and 61 girls. Mean birth weight was 2.9 kg and varied from 2.0 kg to 4.1 kg, 14 % had low birth weight (<2500 gram). Sixty-four percent of the children had been ill within the last two weeks. Twenty-eight of the children had suffered from diarrhea. More than half of the children were born at home, the rest in different hospitals or health stations. The total prevalence of stunting among the children was 8 %, of which 3 % were severe. Ten percent of the children were underweight, 4 % severe. The total wasting prevalence were 9 %, and 2 % were severely wasted. There were no significant differences in gender.

Table 7 Background characteristics of the Saharawi children (n=95).

Background characteristics, children (n=95)	
Age, months (mean (min-max) SD))	2.56 (0-5) 1.44
Birth weight, (mean (min-max) SD))	2897.2 (2000-4100) 545.8
Birth weight <2500 g, % (n)	14 (13)
Gender, % (n)	
male	35 (34)
female	64 (61)
Disease last two weeks, % (n)	
diarrhoea	28 (27)
other disease	36 (35)
Birthplace, % (n)	
home	52 (50)
hospital in the camp	24 (23)
hospital in Tindouf	11 (11)
hospital in Rabouni	7 (7)
health station	4 (4)
Under nutrition, % (n)	
moderate acute malnutrition, -3 and ≤-2 z-score	7 (7)
severe acute malnutrition, <-3 z-score	2 (2)
global acute malnutrition, ≤-2 z-score	9 (9)
moderate underweight, -3 and ≤-2 z-score	6 (6)
severe underweight, ≤-3 z-score	4 (4)
total underweight, ≤-2 z-score	10 (11)
moderate stunting, -3 and ≤-2 z-score	5 (5)
severe stunting, ≤-3 z-score	3 (3)
total stunting ≤-2 z-score	8 (8)

5.2 Feeding practices

5.2.1 Breastfeeding practice measured by the WHO indicators

Table 8 describes the results of breastfeeding practices measured by the IYCF. Almost two thirds (64 %) of the children were put to the breast within one hour after birth. Thirteen percent were put to the breast within the first six hours and a further 6 % within the first day. The proportion of the children that were exclusively and predominantly breastfed were 7 % and 19 % respectively. None of the children were exclusively breastfed at 4-5 months and only 12 % were predominantly breastfed at that age. The prevalence of exclusive breastfeeding was highest (21 %) among the 0-1 month old children, lower among the 2-3 month olds (4 %). The prevalence of predominantly breastfed children were 29 % at age 0-1 months and 18 % at 2-3 months.

Table 8 Breastfeeding by the WHO indicators.

IYCF	% (n)
Initiation of breastfeeding	
within one hour of birth	67 (64)
within the first 6 hours	13 (12)
within the first day	6 (6)
within the second day	5 (5)
within the third day	3 (3)
more than 3 days	5 (5)
Exclusive breastfeeding	7 (7)
0-1 month old	21 (5)
2-3 month old	4 (2)
4-5 month old	0 (0)
Predominant breastfeeding	19 (18)
0-1 month old	29 (7)
2-3 month old	18 (8)
4-5 month old	12 (3)

5.2.2 Additional feeding and breastfeeding practices

Table 9 describes additional breastfeeding practices among the children. The breastfeeding frequencies during the day were high, with the majority of the children (60%) being breastfed "all the time" during the day. Two prevent were breastfed 11-15 times, and 12 % were breastfed 6-10 times. Twenty-six percent were breastfed 1-5 times a day. At the same time all but one child (99 %) were breastfed at least once a night, the majority (59 %) between 1 and 5 times and 32 % were breastfed "all the time". Most of the children (86 %) were breastfed on

demand. Some of the children (22 %) were given prelacteal feeds, sugar water (21 %) and oil water (14 %) being the most common.

Table 9 Other breastfeeding and feeding practices among Saharawi children (n=95).

Breastfeeding and feeding practices	% (n)
Breastfeeding frequency day	
none	0 (0)
1-5 times	26 (25)
6-10 times	12 (11)
11-15 times	2 (2)
all the time	60 (57)
Breastfeeding frequency night	
none	1 (1)
1-5 times	59 (56)
6-10 times	6 (6)
11-15 times	1 (1)
all the time	32 (31)
Breastfeeding on demand	
yes	86 (82)
Foods given before breastfeeding initiation	22 (21)
sugar water	21 (20)
oil water	14 (13)
infant formula	1 (1)
saline solution	1 (1)
Other foods given the previous day	
water	75 (71)
infant formula	35 (33)
dates	33 (31)
oil water	23 (22)
sugar water	17 (16)
goat milk	10 (9)
camel milk	7 (7)
lenses	5 (5)
bread	5 (5)
soup	4 (4)
rice	4 (4)
porridge	3 (3)
vegetables	3 (3)
fruits	2 (2)
sweets	1 (1)
candia milk	1 (1)

Figure 3 illustrates the complimentary foods given to the children. The 24- recall data collected reveals that almost all the children were given water (75 %) the day previous of the recording, 35 % were given infant formula and 33 % dates. Oil water (23 %) and sugar water

(17 %) were commonly given to the children as well as a variety of other foods. Goat milk and camel milk (10 % and 7 % respectively) were more used than candia milk[2] (1 %). Solid and semi-solid foods such as bread (5 %), soup (4 %), rice (4 %), porridge (3 %) vegetables (3 %) and fruits (2 %) were also given to the children.

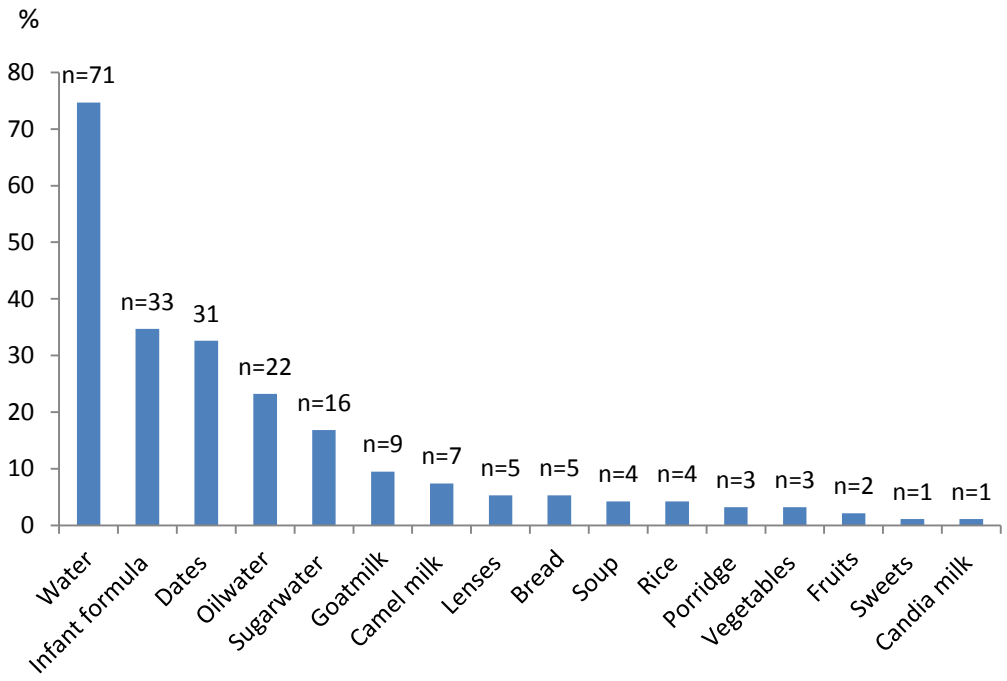

Figure 3 Frequency of foods given to the Saharawi children the previous day (n=95).

5.3 Distribution of feeding practices

5.3.1 The mothers breastfeeding knowledge

Figure 4 shows what age the mother intends to introduce complimentary foods to their child, and the proportion of children that are given complimentary foods or liquids at the same age, and to what age the mother intends to continue the breastfeeding. Almost all (84 %) answered until the age of two or longer. Most of the mothers, 78 %, planned to introduce complimentary foods at 6 months age, although results show that 96% of the children are given complimentary fluids and/or food already at 3-4 months of age.

[2] Ultra- pasteurized cows' milk that stores in room temperature.

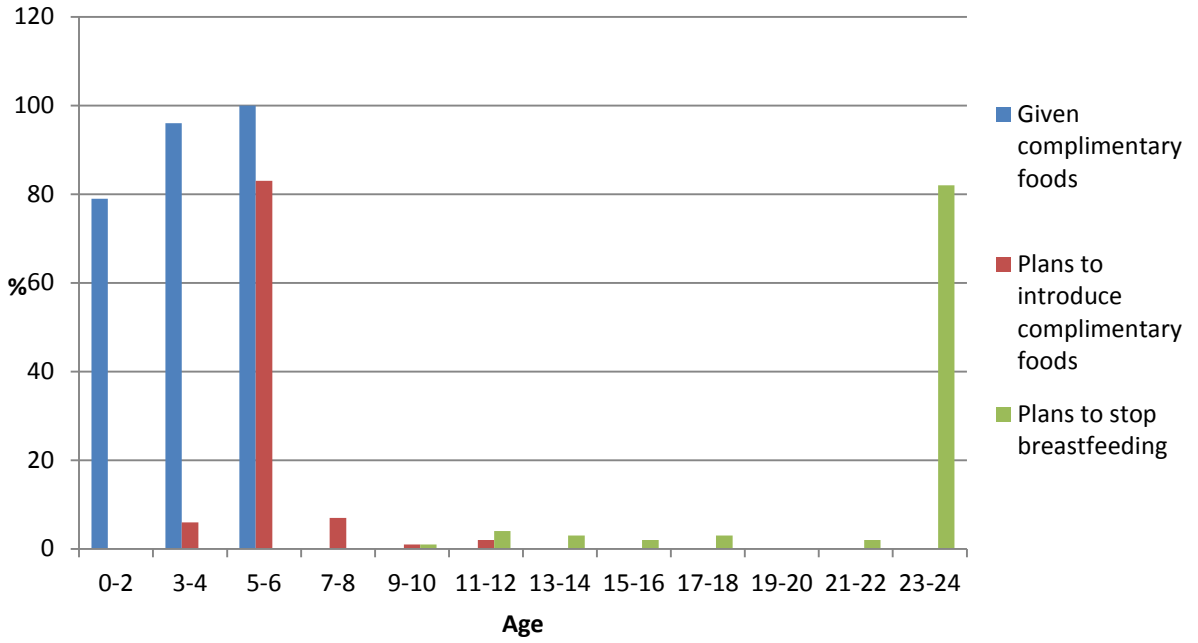

Figure 4 Frequency of children given complimentary foods, child's age when planning to introduce complimentary foods and child's age when the mother plans to cease breastfeeding (n=95).

5.3.2 Feeding practices in different group- and household compositions.

Table 10 shows how the breastfeeding practices (breastfeeding initiation, breastfeeding frequency day and night and prelacteal feeding) are distributed throughout different groups; age mother, education mother, work situation, gender child, age child, number of children in household, gender of head of household and number of members in household.

In households led by men, significantly (p=0.03) more children were put to the breast within one hour of birth (81 %), and given significantly (p=0.01) less prelacteal feeds (12 %), than in households led by women (61 % and 33 % respectively).

Children born into large households and/or with 2 or more children were given significantly (p=<0.00) less foods (11 %) before breastfeeding initiation, and significantly (p<0.05) more were put to the breast (79 %) before one hour had past. In small households and/or households with few children, 59 % had initiated breastfeeding within one hour, and 39 % were given prelacteal feeds.

There were no differences in breastfeeding practices between older and younger mothers or mothers with shorter or longer education. Mothers that worked outside the home breastfed less (p=0.02) at night than mothers that stayed at home with the children (6 % and 47 % respectively breastfed more than 5 times per night).

Forty-eight percent of the girls were breastfed more than 5 times per night which were significantly ($p=0.04$) more than the boys (27 %). There were no differences in breastfeeding practices between the older and younger children.

Breastfeeding behavior (including breastfeeding on demand, exclusive and predominant breastfeeding) were also tested towards other factors such as age of head of household, number of children diseased, child's height and weight, foods given the previous day, child's age when introduced to complimentary foods, mothers health control attendance during pregnancy and place of labor, but no differences were found.

Table 10 Breastfeeding practices in different groups and living conditions (n=95).

	Prelacteal feeding (%) **n=22**	**Breastfeeding initiation within 1 hour (%)** **n=64**	**Breastfeeding > 5 times/day (%)** **n=70**	**Breastfeeding > 5 times/night (%)** **n=38**
MOTHER				
Age				
≤ 29 years, n=37	30 (p=0.15)	72 (p=0.91)	76 (p=0.73)	41 (p=0.93)
> 29 years, n=58	17	71	72	40
Education				
>10 years, n=66	24 (p=0.50)	68 (p=0.49)	74 (p=0.66)	42 (p=0.17)
≤ 10 years, n=23	17	76	70	26
Work situation				
works outside home n=17	NA	NA	NA	**6 (p=0.02)**
stays at home n=78	NA	NA	NA	47
CHILD				
male, n=34	27 (p=0.44)	68 (p=0.57)	71(p=0.70)	**27 (p=0.04)**
female, n=61	20	73	75	**48**
age, 0-2 months, n=50	28 (p=0.14)	74 (p= 0.55)	80 (p=0.14)	42 (p=0.68)
age, 3-5 months, n=45	16	68	67	38
HOUSEHOLD				
Number of children				
1-2, n=39	**39 (p< 0.00)**	**59 (p<0.05)**	72 (p=0.73)	39 (p=0.80)
≥3, n= 56	**11**	**79**	75	41
Household members				
≤ 6, n=39	**39 (p<0.00)**	**59 (p<0.05)**	72(p=0.81)	39 (p=0.97)
> 6, n=54	**11**	**79**	74	39
Head of household				
male, n=50	**12 (p=0.01)**	**81 (p=0.03)**	78 (p=0.31)	34 (p=0.21)
female, n=45	**33**	**61**	69	47

Chi-square test used for analysis. NA results not valid because of small expected count (<5).

5.4 Feeding practices, malnutrition and disease

Of all the children, 14% were malnourished in some way, stunted, wasted and/or underweight. Although the data material is small, it is worth mentioning that none of the exclusively or predominantly breastfed children were malnourished. The child's gender, birthplace, recent disease or diarrhea had no significant association with malnutrition. Although the expected count in the analysis is less than five, analysis show that all the stunted (p=0.02) and nine of the ten underweight (p=0.07) children were girls. There was no difference in malnutrition between the children with different breastfeeding frequencies day and night or breastfeeding on demand.

Table 11 describes feeding practices and prevalence of diarrhea and other diseases among the children. Children who were given prelacteal feeds reported to have had significantly (p=0.03) more diarrhea the past two weeks than the ones who were not, 48 % and 23 % respectively.

Table 11 Feeding practices, diarrhea and other disease among Saharawi children (n=95).

			Diarrhea, (%), n=27	Other disease, (%), n=35
Predominantly breastfed	Yes	n=18	33 (p=0.61)	22 (p=0.15)
	No	n=77	27	40
Prelacteal feeding	Yes	n=22	**48 (p=0.03)**	38 (p=0.89)
	No	n=73	**23**	37
Child gender	Boys	n=34	27 (p=0.75)	41(p=0.51)
	Girls	n=61	30	34

There were not found any further differences between breastfeeding initiation and/or foods given before it and the prevalence of any malnutrition, diarrhea or other diseases. Further, analysis did not reveal any differences between foods given and the previous day and prevalence of stunting, wasting, under nutrition, diarrhea and other diseases.

There were not found any differences between the mother's BMI, age, education, health controls attendance, fluid intake, diet when pregnant, and the prevalence of malnutrition of any kind in the child. Household size and number of children were analyzed towards prevalence of malnutrition without differences in results.

6 Discussion

Results show that prevalence of wasting and underweight among the children were low to moderate. Two thirds of the children are put to the breast within one hour after birth, but many were given prelacteal feeds. The children who were given prelacteal feeds had suffered more diarrhea the past 2 weeks. Children born into large households and/or with many children were more frequently put to the breast within one hour of birth and given less food before the breastfeeding initiation. Few of the children were exclusively or predominantly breastfed, 7 % and 19 % respectively. Almost all the children were breastfed relatively frequently, both day and night, and most of the children were breastfed on demand. Most of the children were given foods using data from 24 hour-recall. Differences in breastfeeding frequency during the night were seen between genders in favors of the girls, and the children of mothers that stayed at home with the children.

6.1 Discussion of study design and sample

The study design, sampling procedure, fieldwork and data collection are already discussed and described thoroughly by the two students that carried out the work (Grewal, 2011; Aakre, 2011). As the collection of the material was already completed and unchangeable, and therefore were not strictly a part of this thesis, these aspects of the methodology will not be discussed in depth. However, some issues regarding sample selection, recruitment and study design, have directly influenced the results in this thesis, and they must be considered. Apart from this, discussion of methods will concentrate on how data is processed and analyzed for use in this thesis.

6.1.1 Study design

Using a cross sectional study design has its benefits, but also limitations. It is somewhat easy to carry out, and gives a good picture of the situation at the time of the investigation. However, it does not capture changes over time, thus being unable to establish any casual link between two factors (Nelson, 1997). This study were intended as the baseline for a cohort,

making it possible to detect changes over time, but for the time being, the results only identify differences between the groups.

6.1.2 Sample

The plan was to randomly draw participants from lists of inhabitants. Upon arrival, such lists were not available. Therefore, subjects were recruited by local health workers that drove around by car recruiting the requested number of participants from each area. It is not unlikely that women that had attended health controls during pregnancy and/or maternity were selected first, since these were the women familiar to the health workers. When analyzing the material it became clear that only 10% of the participants had not attended health controls when pregnant. If this is the true proportion in the population is not known, but it is considerably lower than the world wide estimate of 50 % (UN, 2013). An American study shows that women with many children attend less prenatal care than those with few children (Brown, 1988; Sidney**,** Diwan, El-Khatib & de Costa, 2012). One explanation could be that the more experienced mothers do not feel the need to attend controls, since they have a lot of experience. It is also likely that, having a large family and several children, make it harder to fit the controls into the daily schedule. However, the interviews do not inquire whether the lack of controls is by their own choice or not.

Since results show that the mothers attending health controls are generally the younger and less experienced ones, and that these women breastfeeds less in line with recommendations it is not unthinkable that this presents a selection bias in results. The validity of the results may therefore be compromised, as it is possible that the prevalence of some breastfeeding behaviors would have been higher, had the selection been random.

Since the living condition in the camps is so unusual, performing research here might lead to different challenges. Investigating differences between living conditions, education, foods available and similar factors may prove difficult since the differences are small. For example, all the refugees are dependent on food aid like the food basket to survive, which makes their diet almost identical. Living conditions like housing, sanitary amenities and other facilities are also very similar for everyone living in the camps. On the other hand, since living conditions are very similar for all inhabitants, selection bias is likely to have less impact than it would if the differences had been bigger. Results may therefore still be valid for the population of

women and infants in the camps, and even other refugee camps with similar conditions. External validity is probably low because of the rare setting in refugee camps.

6.1.3 Data material & sample size

Working with a previously collected material led to several challenges. The original study was designed to investigate issues around iodine and goiter. Sample size were calculated based on the prevalence of goiter among women in the area, and were therefore not large enough to fully describe the breastfeeding situation. It was particularly difficult to analyze the distribution of exclusive and predominant breastfeeding in different groups since the prevalence were so small. Knowing that earlier studies in the camps show low prevalence of exclusive (11 %) and predominant breastfeeding (47 %) (UNHCR & WFP, 2011) one would have calculated the sample size using previous data on breastfeeding to ensure a sufficient size. With a data collection designated to the topic, it may also have been desirable to gather other information, for instance, about the use of and/or lack of use of colostrum. The data material may therefore not be ideal for describing the research questions in this thesis, possibly leading to absence of significant differences that would have been discovered using a study designated to the issue. Even so, since there are so little research on breastfeeding practices and malnutrition among children under 6 months in the camps, it was worthwhile analyzing the data material, especially since it was already available. Doing so, some interesting and perhaps surprising differences between some of the groups were found. These could be valuable for the continuation of nutrition research in the camps.

6.2 Discussion of methods.

The original data were not collected with *Indicators for assessing young infant and child feeding practices* (WHO & UNICEF, 2007a) in mind. Even so, when excluding the children between 6 and 7 months, the methodology used is compatible with the instructions given in the indicators.

6.2.1 Data processing & statistical analysis

The continuous and some of the categorical variables were recoded into new categorical variables with two categories in order to make them more manageable.

The questionnaire used to gather data about the breastfeeding frequencies has the categories *0, 1-5, 6-10, 11-15* and *all the time*. A Swedish study of 506 breastfed infants found that the amount of feeds during the day ranged from 3 to 11, and between 1 and 5 during the night (Hörnell, Aarts, Kylberg, Hofvander & Gebre-Medhin, 1999). When analyzing the data it became clear that categories may not be suitable to distinguish between what should be considered sufficient or not sufficient breastfeeding especially during the night. While breastfeeding three to five times a night may be adequate, one or two feedings may not, particularly for the youngest of the children. Cut off between low and high breastfeeding frequency are therefor set to ≤5 and >5 times even if it is not the ideal cutoff.

The mother's age variable was continuous, and could have been divided into several categories. Research show that mothers over the age of 29 breastfed their children significantly more than younger mothers (Li, Darling, Maurice, Barker & Grummer-Strawn, 2005). Cut off were set to ≤29 and >29 years.

The original categories for mothers education were *None, Less than 6th grade, 6th grade, 7 to 9th grade, 10 to 12th grade and 5=Higher education.* It was necessary to divide the women two groups with lower and higher education. An American study shows that breastfeeding prevalence rose according to the mother's education and that college graduates breastfed more than those with shorter education (Li et al., 2005). Since few of the women had any form of higher education and it was unknown whether the women who did had graduated or not, cut off were set at ≤10 years.

Different cut offs were tried when analyzing household size and number of children. It soon became clear that there were distinction between breastfeeding behavior in children born into small households with ≤6 members and ≤2 children, compared to the larger units.

Even though research suggests that increased fluid intake does not increase production of breast milk (Dusdieker, Booth, Stumbo & Eichenberger, 1984), lactating women are advised to increase their liquid intake to ensure that the fluid is replaced (Helsedirektoratet, 2011). The average sedentary adult woman needs at least 2,200 mL a day; 1000 ml of this is normally provided trough solid foods (Kleiner, 1999). Average intake of breast milk for children under 6 months varies in different studies; some suggestions are 753 g (Neville et al., 1988) and 818 g (Dewey, Heinig, Nommsen & Lonnerdal, 1991) per day. Adding these together indicates that the women should drink around 2000 grams of fluid each day to replace their losses. However, the hormone prolactin (stimulates breast milk production and

several other processes in the human body) affects the osmoregulation and renal function again affecting the amount of fluid required (Crambert ,Sjöberg , Eklöf, Ibarra & Holtbäck, 2010). Since it was uncertain how much fluid were needed, breastfeeding practices were analyzed towards several cut offs (1200 g, 1500 g, 1700 g and 2000 g of liquid). This was done to see if a distinction would appear, however no significant differences were seen at any of the cut offs.

Data were analyzed using bivariate cross tables and chi- square tests to identify differences between groups. This is a simple method to identify differences between groups and it is suitable for categorical variables, however it does not indicate how strong the relationship is.

6.3 Discussion of results

6.3.1 Sample characteristics

The average BMI was 27 kg/m^2 and 46 % of the women were overweight and 22 % were obese. One should keep in mind that these women had recently been giving birth. On the other hand, expected amount of fat deposited during pregnancy is 4 kg. Further, maternal weight gain is expected to be lost within 4-6 months after birth (WHO, 1995). Even though many of the women had given birth more recently than 4-6 months, the magnitude of the overweight problem can not be accounted for by pregnancy weight gain alone (WHO, 1995).

The average height among the women was 156 cm. In comparison, similar countries have higher average height for women, for example Mali with 161 cm and in Senegal 163 cm and Morocco 159 cm (Subramanian, Özaltin & Finlay, 2011). More than two thirds of the women were born after the conflict in Western Sahara, and are likely to have grown up in the camps. It is possible that the short stature of the women is a result of childhood stunting (Bozzoli, Deaton & Quintana-Domeque, 2009).

In April 2006 WHO went from using National Center for Health Statistics (NCHS) reference to the new WHO standards as tool for measuring growth among children under 5 years. When comparing anthropometric measures, there are considerable differences between the two, especially among the children under 6 months (de Onis, Onyango, Borghi, Garza, & Yang, 2006). The main difference is that, in the new standards, bottle-fed children under 6 months are not included in the reference population. Since bottle-fed children on average are heavier than the exclusively breastfed (Dewey, Heinig, Nommsen, Peerson & Lönnerdal, 1992) , this

results in a lower average in the WHO standards. Even though the new standards are considered a better tool for assessing children's growth, this change of reference may present challenges when comparing z-scores calculated before and after the change.

The sample of children consisted of 34 boys and 61 girls. The girls were overrepresented by approximately 2:1 ratio, although this has no impact on under nutrition results, since calculation of z-scores takes the gender difference in weight into account (WHO & UNICEF, 2004). The average birth weight was 2897 grams. Fourteen percent of the children had low birth weight (<2500 grams) which is similar to data from the Western Africa region (15, 4 %)(WHO & UNICEF, 2004), although these numbers also includes diseased children as opposed to the present study. Previous studies suggest that stunting prevalence among children in the camps under 6 months deteriorated from around 3 % in 2002 to 13 % in 2010 (UNHCR & WFP, 2010). Stunting typically takes a long time to fully develop, and it is not commonly seen among the youngest of the children (WHO, 1997). Nevertheless, 8 % of the children fall into this category. A stunting prevalence of 8 % and wasting prevalence of 9 % is considered low to moderate by WHO definition. Nevertheless, the prevalence is alarming since the children are so young. Numbers are considerably higher than the 2 % to 4 % seen in the UNHCR & WFP report (2010).

Approximately two thirds of the children had been ill within the last two weeks, 28% with diarrhea. Studies suggest diarrhea weakens the children's nutritional status and contributes to under nutrition (Brown, 2003). Since the proportion of children that had diarrhea the previous weeks are so high, it is likely that this is a contributing cause to the wasting and possibly stunting over time, although no significant differences were found.

Non-communicable diseases such as diabetes, cancer and cardiovascular disease have long been the major cause of illness and death in the developed world. In developing countries, there is an increasing trend in the prevalence of such diseases (Boutayeb, 2006) while infectious diseases are still a major health problem. This is often referred to as the double burden of disease (WHO, 1997). The high prevalence of infectious diseases and malnutrition among the children, together with the prevalence of overweight and obesity among the women suggests that this this is a problem in the camps. Adding to the problem is the element of intrauterine growth retardation, where infants that were undernourished in utero have higher risk of chronic diseases later in life (Godfrey & Barker, 2000).

Almost half of the children were born in a hospital or health post, and 90 % of the women had attended prenatal care. Several studies show that such a close cooperation between the women and health professionals normally results in improved breastfeeding practices (Deshpande & Gazmararian, 2000; de Oliviera, 2001; Riva et al. 2007). Other studies show the mothers that have access to health facilities and information of IYCF was more likely to initiate breastfeeding (Riva et al., 2007) and 4 times more likely to breastfeed exclusively (Egata, Berhane, Worku, 2013). This is not seen in the present study, indicating that the contents and quality of the health care needs evaluating.

6.3.2 Feeding practices

Breastfeeding initiation

The results show a relatively high prevalence of early initiated breastfeeding, almost two thirds of the children were put to the breast within one hour after birth. This is considerably higher than in Morocco, Niger and Mali where 44 %-48 % of the women initiated breastfeeding within the hour. Mothers breast feeding knowledge is positively associated with the initiation of breastfeeding (Mitra, Khoury, Hinton & Carothers, 2004), which could indicate that women are aware the recommendations and the benefits of early initiation. On the other hand, taking the low compliance with other breastfeeding recommendations into account, it could also very well be due to cultural custom.

Exclusive and predominant breastfeeding

The prevalence of exclusively (7 %) and predominantly breastfeeding (19 %) were low. The figures for exclusive breastfeeding are similar to those seen in 2010 (11 %) but considerable lower for the predominantly breastfed (47 % in 2010) (UNHCR & WFP, 2011). Compared to the world wide prevalence of 39 % (UNICEF, 2013) it is very low. The prevalence is also considerably lower than seen in other countries in the area, where 14-38 % of the children were exclusively breastfed (Niger, Marocco, Senegal and Mali) and 48-84 % were predominantly breastfed (WHO & UNICEF, 2010). In these countries, like in the camps, prevalence decreased as the children grew older.

Even if there is a certain consistency with previous findings in the camps, it is important to consider the possible selection bias in this study. Since mothers attending prenatal care could be overrepresented, and these mothers are generally younger and less experienced, it is

possible that the actual prevalence of exclusive and predominant breastfeeding is higher in the population. One should also consider that the previous studies use different measures, making them less comparable.

Breastfeeding frequencies

When evaluating the breastfeeding frequency, it is important to consider the following: When testing the questionnaires, it became clear that there are some fundamentally differences in how women breastfeed their children. In some countries it is common to breastfeed the child with certain intervals. In Western Sahara many women keep their children to the breast most of the time, day and night, so that the child can nurse freely. This causes very high breastfeeding frequency for some and more than half the children were breastfed "all the time" during the day. It is important to take into account that this high frequency of breastfeeding is not comparable to frequencies where the children are given defined "meals".

According to a review by Cameron (1998), there is no evidence that the time spent breastfeeding indicates the amount of milk actually transferred to the child. Another study suggests that the child regulates their milk intake as complimentary foods are introduced (Cohen, Brown, Dewey, Canahuati & Rivera, 1994). Knowing that the children were also given a range of other foods and liquids, it is likely that the amount of milk actually drunken is smaller than the frequencies could suggest.

All but one child was breastfed at least once a night. Since the night is shorter than the day, it naturally that this frequency is lower. The definition of a night is also not clearly described in the questionnaires, and could in some cases be only a few hours. Additionally, if the woman breastfeeds the child just before going to sleep, once in the nighttime, and just after waking up, this could still mean that the child is breastfed with only a few hours in between.

Breastfeeding on demand

Knowing that most of the children are kept to the breast most of the time it may not be surprising that most of the children were breastfed on demand. Such a practice may lead the child to suckle frequently, stimulating the milk production (WHO, 2009). Children that are fed on demand according to their appetite are more likely to receive the nutrients necessary to maintain an optimal growth and development (Kent et al., 2006).

Prelacteal feeds

The twenty-two percent of the children that were given prelacteal feeds had suffered from significantly more diarrhea the past two weeks, than those that were not. Giving prelacteal feeds interferes with the establishing of breastfeeding and is associated with higher prevalence of diarrhea and other diseases (WHO, 2009). The amount of prelacteal feeding was inversely related to the early initiation of breastfeeding, however it is not clear what is the cause and what is the effect. Since the prevalence of prelacteal feeding was inversely related mothers age and the younger mothers might be overrepresented, there are a possibility that the results are biased, showing higher prevalence than in the actual population. Prevalence and p- value for prelacteal feeding and early initiation of breastfeeding were identical for the small households and those with few children. It was also identical for the larger families and the families with many children. It is possible that these are the same family units.

Other foods given

Results show that almost all the children were given water the day previous of the recording, in addition to other foods. Since the children are under six months of age and should preferably be exclusively breastfed these results are discouraging. Children that are not exclusively breastfed until the age of six months have many times the risk of dying during the first months of life (WHO, 2009) as well as developing a range of infectious and chronic diseases like wasting and stunting (Diallo, Bell, Moutquin & Garant, 2009; WHO, 2009) especially those living under difficult circumstances (UNICEF, 2013). It is possible that the mother for some reason believe that giving prelacteal and complimentary feeds is good for the child, a common perception described in some studies (Fikree, Ali, Durocher & Rahbar, 2005). However the rationale for the women's breastfeeding behavior is not well understood.

6.3.3 Distribution of feeding practices

The mothers' breastfeeding knowledge

When the mothers were asked for how long they intended to breastfeed, almost all (84 %) answered until the age of two or longer. This is in line with the recommendations (WHO, 2010). When asked when they intend to introduce their child to complimentary foods almost all (78 %) answered around the age of 6 months. This is also in line with the recommendations (WHO, 2010). Yet when looking at results from the 24 hour recall, most of the children (96 %) were fed complimentary foods already at 3-4 months of age. This could

indicate that the women knows the recommendations, but for some reason do not follow them. On the other hand, it could mean that the women are so accustomed to the practice of giving complimentary foods, that they do not in fact consider it to be complimentary at all.

Household composition

The differences in prelacteal feeding and breastfeeding initiation seen between larger and smaller households and/or with few or many children may be explained by different causes. Research shows that mothers that have breastfed before are likelier to initiate breastfeeding than those who have not (Mitra et al., 2004). The results show that the mothers with only one or two children gave their children more prelacteal feeds than mothers with several children ($p<0.00$), however another study finds no differences in parity (Kishore & Garg, 1999).

The results show higher prevalence of early initiation of breastfeeding in large families. Similar findings are described in other studies that show that breastfeeding initiation frequency increased parallel to the mother's social network (Singh, Kogan & Dee, 2007) and perceived social network (Mitra et al., 2004). It could also be related to parity, as first- time mothers are more likely to have had longer (8.6 hours compared to 6 hours in multiparous women) (Albers, Schiff & Gorwoda, 1996) and more complicated births, leaving her indisposed for some time after. This is supported by an Egyptian study where prelacteal feeding is associated with births lasting over 8 hours (Hossain, Radwan, Arafa, Habib & DuPont, 1992). Likewise, more children born into small households were given prelacteal feeds than those in large households ($p<0.00$). Whether this is a cause or effect of the fact that they initiated breastfeeding later is unknown.

It might seem surprising that in households led by men, the frequency of early initiated breastfeeding is higher than in those led by women ($p=0.03$). An American study shows that fewer of the single mother's initiate's breastfeeding than those living with the child's father (Singh, Kogan & Dee, 2007). One explanation might be that in households led by women, more of the workload falls on the woman herself, not giving her the necessary time and quiet with the newborn. In households led by men, more women have high breastfeeding frequency during the day than in households led by women (68.9 %), probably for the same reasons as mentioned above. For the breastfeeding frequency at night, the results are quite opposite, where more women have a high frequency at night when lead by a woman, than by a man

(p=0.01). This may be a result of the child compensating for the lower frequency in the daytime.

Mother's age, education and work situation

Although not significant, younger mothers tended to give their children more prelacteal feeds than older mothers. This tendency is supported by a study from Nigeria (Ibadin, Ofili, Monday & Nwajei, 2013). Although much lower total prevalence of prelacteal feeding (11.7 %), the practice here was strongly associated with low maternal age. Other research shows that older mothers had much higher early initiation frequency (70 %) than younger mothers (43%) (Ryan, 1997) which again could relate to less prelacteal feeding. This suggests that the children with younger mothers are especially at risk of not being breastfed according to recommendations and needs extra attention.

The mothers with shorter education are more likely to have a high breastfeeding frequency at night than mothers with longer education. The women with shorter education have a slightly higher prevalence of early initiation of breastfeeding than those with longer education, even though the results were not significant. Other studies show that mothers with longer education are generally more likely to breastfeed their children (Li, Ogden, Ballew, Gillespie & Grummer-Strawn, 2002; Riva et al., 2007). On the other hand the women with higher education are more likely to have work outside the home, thus being more away from her child, and not being available for breastfeeding all the time. This is supported by studies that shows that mothers that return to work after giving birth breastfeeds their children less than those that stay at home (Biagioli, 2003; Scott, Binns, Oddy & Graham, 2006). More of the mothers that stayed at home had a high breastfeeding frequency at night (p=0.02). This is probably related to the fact that milk production decreases (UNICEF, WHO, UNESCO, UNFPA, UNDP, UNAIDS, WFP & the World Bank, 2010) if the mother is away and the breast is not emptied for long period every day.

Childs gender and age

More girls were breastfed frequently during nights (p=0.04). Not many studies find this gender difference. An Australian study (Scott, Aitkin, Binns & Aroni, 2007), although set in a different cultural circumstance, has found that male infants are weaned earlier than the female infants.

Since so few of the children were exclusively or predominantly breastfed, it was difficult to find differences between the groups. When viewing the results together we see that it is the youngest women with less children and in small households that breastfeeds less in line with recommendations. It is likely that there is a considerable overlap between the groups. The youngest of the women attended more health controls and breastfed slightly less on demand than the older women. This difference is just as likely to be due to age and experience as the actual health controls.

6.3.4 Feeding practices, malnutrition and disease

Relatively many children were malnourished in some way, stunted, wasted and/or underweight. Discovering that none of the exclusively or predominantly breastfed children were malnourished, is not surprising and in compliance with previous research (WHO, 2009). Results show that all but one of the stunted and wasted children was girls. This is not seen in in a review from sub-saharan Africa (Wamani**,** Åstrøm**,** Peterson**,** Tumwine & Tylleskär, 2007) where boys were more likely to be stunted than girls. This result also contradicts results showing that the girls were breastfed more during the night, and could be explained by the gender difference in the sample.

Of all the factors tested towards disease, there were only found differences ($p=0.03$) between those given prelacteal feeding and the prevalence of diarrhea among the children. Similar results are seen in a study from Egypt (Hossain et al, 1992). According to the WHO (2009), prelacteal feeding is associated with an elevated risk of diarrhea.

7 Conclusions and implications

The results suggest that the women and children are facing several nutritional and health challenges. Many of the women were overweight and might have elevated risk of diseases like diabetes type 2 and heart disease.

Supported by previous studies in the camps, this study shows that relatively many children were malnourished in some way, either stunted, wasted and/or underweight. This is concerning when considering the children's young age. One fifth of the children were given prelacteal feeds and put to the breast after an hour had past after birth. The prevalence of diarrhea among the children was high, and associated with prelacteal feeding. It is likely that the practice of giving prelacteal feeds is contributing to the malnutrition seen among the children.

The prevalence of exclusive (and predominant) breastfeeding was low and many children were given complimentary feeds. The results do not reveal differences between exclusively and non-exclusively breastfeed children. Even if the actual prevalence of exclusive and predominant breastfeeding in the population might be higher than this results indicates, it is likely that the under nutrition, disease and child mortality seen in the camps are at least partly explained by lack of exclusive breastfeeding and premature introduction of complimentary foods. It is likely that the children in the camps have an elevated risk of developing both infectious and non-communicable diseases later in life. The children of younger mothers with small families and few children were especially at risk.

Knowing how effectively appropriate breastfeeding practice and especially exclusive breastfeeding during 6 first months of life improves the child's health and survival, there are without doubt much to gain in improving breastfeeding practices among the women in the camps. At the same time, it is important to encourage to the continuation of the positive breastfeeding practices already seen in the camps, especially the early initiation of breastfeeding, breastfeeding on demand and carrying the child to the breast most of the time.

Giving birth in a medical facility and attending health controls presents a golden opportunity of receiving valuable help and information about breastfeeding. Knowing that 90 % of the mothers attended health controls during pregnancy, and half gave birth at a health station or hospital, it is reasonable to question the quality of the information they were given. Having said that, it is possible that the breastfeeding practices would have been even poorer, had it

not been for the health controls. Further research is needed to evaluate the information given at health stations and hospitals.

Even though we do not know enough about the quality of the health controls, it seems clear that the mothers do not possess the necessary knowledge about breastfeeding. It is unlikely that the mothers would willingly expose their children the dangers of non-exclusive breastfeeding and prelacteal feeding. Whether these practices are due to lack of knowledge, inaccurate assumptions or simply resilient cultural customs and are yet to be determined, and calls for further research.

The next step now must be to identify the causes why some of the breastfeeding practices are so far from the recommendations. Then first, will it be possible pinpoint specific measures in order to improve the breastfeeding practices in the camps.

References

Aakre, I. (2011). *Iodine intake and iodine status among lactating women and their children in the Saharawi refugee camps, Algeria* (Master thesis, Akershus University College, Norway). Retreved 23.10.2013 from ttps://oda.hio.no/jspui/bitstream/10642/743/1/maeh2011_aakre.pdf

Albers, L.L, Schiff, M & Gorwoda, J.G. (1996). The length of active labor in normal pregnancies. *Obstetrics & Gynecology*, *87*(3), 355–359.

Anderson, J.W., Johnstone, B.M. & Remley, D.T. (1999). Breastfeeding and cognitive development: a meta-analysis. *American Journal of Clinical Nutrition, 70*, 525–535.

Bachrach, V.R., Schwarz, E. & Bachrach, L.R. (2003). Breastfeeding and the risk of hospitalization for respiratory diseases in infancy: a meta-analysis. *Archive of Pediatrics and Adolescent Medicine, 157*, 237–243.

Bahl, R., Frost, C., Kirkwood, B.R., Edmond, K., Martines, J., Bhandari, N. & Arthur, P. (2005). Infant feeding patterns and risks of death and hospitalization in the first half of infancy: multicentre cohort study. *Bulletin of the World Health Organization*, *83*, 418–426.

Boutayeb, A. (2006) The double burden of communicable and non-communicable diseases in developing countries. *Transactions of the Royal Society of Tropical Medicine and Hygiene, 100*(3), 191-199.

Bozzoli, C., Deaton, A. & Quintana-Domeque, C. (2009). Adult height and childhood disease. *Demography, 46*(4), 647-669.

Brown, K. (2003). Diarrhea and Malnutrition. *The Journal of Nutrition*, *133*(1), 328-332.

Brown, S.S. (1988). *Prenatal care: reaching mothers, reaching infants: summary and recommendations.* National Academies.

Cameron, E.Z. (1998). Is suckling behaviour a useful predictor of milk intake? A review. *Animal Behaviour, 56*(3), 521-532.

Chua, S., Arulkumaran, S., Lim, I., Selamat, N., Ratnam, S.S. (1994). Influence of breast feeding and nipple stimulation on post-partum uterine activity. *British Journal of Obstetrics & Gynaecology, 101,* 804–805.

Cohen, R.J., Brown, K.H, Dewey, K.G, Canahuati, J. & Rivera, L.L. (1994). Effects of age of introduction of complementary foods on infant breast milk intake, total energy intake, and growth: a randomised intervention study in Honduras. *The Lancet, 344* (8918), 288- 293.

Collaborative Group on Hormonal Factors in Breast Cancer. (2002). Breast cancer and breastfeeding: collaborative reanalysis of individual data from 47 epidemiological studies in 30 countries, including 50 302 women with breast cancer and 96 973 women without the disease. *Lancet, 360,* 187–195.

Deshpande, A.D. & Gazmararian, J.M. (2000). Breast-Feeding Education and Support: Association with the Decision To Breast-Feed. *Effective Clinical Practice, 3,* 116-122.

de Oliveira, M.I.C. (2001). Extending Breastfeeding Duration Through Primary Care: A Systematic Review of Prenatal and Postnatal Interventions. *Journal of human Lactation, 17*(4), 326-343.

de Zoysa, I., Rea, M. & Martines, J. (1991). Why promote breast feeding in diarrhoeal disease control programmes? *Health Policy and Planning, 6,* 371–379.

Dewey, K. G. & Begum, K. (2011). Long-term consequences of stunting in early life. *Maternal and Child Nutrition, 7,* 5-18.

Dewey, K., Heinig, M.J., Nommsen, L.A, Peerson, J.M.& Lönnerdal, B. (1991). Maternal Versus Infant Factors Related to Breast Milk Intake and Residual Milk Volume: The DARLING Study. *Pediatrics, 87*(6), 829-837.

Dewey, K., Heinig, M.J., Nommsen, L.A, Peerson, J.M.& Lönnerdal, B. (1992). Growth of Breast-Fed and Formula-Fed Infants From 0 to 18 Months: The DARLING Study. *Pediatrics, 89,* 1035-1041.

Diallo, F.B., Bell, L., Moutquin, J-M. & Garant, M-P. (2009). The effects of exclusive versus non-exclusive breastfeeding on specific infant morbidities in Conakry. *Pan African Medical Journal, 2*(1).

Dusdieker, L.B, Booth, B.M., Stumbo, P.J. & Eichenberger, J.M. (1984). Effect of supplemental fluids on human milk production. *The Journal of Pediatrics, 106*(2), 207-211.

Edmond, K.M., Zandoh, C., Quigley, M.A., Amenga-Etego, S., Owusu-Agyei, S. & Kirkwood, B.R. (2006). Delayed Breastfeeding Initiation Increases Risk of Neonatal Mortality. *Pediatrics, 117,* 380 -386.

Egata, G, Berhane, Y., & Worku, A. (2013). Predictors of non-exclusive breastfeeding at 6 months among rural mothers in east Ethiopia: a community-based analytical cross-sectional study. *International breastfeeding journal, 8*(8).

Eip Info. (2011). Retrieved 09.05.11 from http://wwwn.cdc.gov/epiinfo/

Fikree, F.F., Ali, T.S, Durocher, J.M. & Rahbar, M.H. (2005). Newborn care practices in low socioeconomic settlements of Karachi, Pakistan. *Social Science & Medicine, 60*(5), 911-921.

Godfrey, K.M. & Barker, D.J. (2000). Fetal nutrition and adult disease. *American Journal of Clinical Nutrition, 71*(5),1344-1352.

Grewal, N.K. (2011). *Iodine status and thyroid function among lactating women in Saharawi refugee camps, Algeria.* (Master thesis. Akershus University College, Norway). Retreved 23.10.2013 from https://oda.hio.no/jspui/bitstream/10642/718/1/maeh2011_grewal.pdf

Gwatkin, D. R. (2000*).* Poverty, inequality, and health: an international perspective. In: Leon, D. A., & Walt G., (Eds.), *Poverty and inequalities in health within developing countries: filling the information gap.* Oxford: Oxford University Press.

Harder T., Bergmann, R., Kallischnigg, G. & Plagemann, A. (2005). Duration of breastfeeding and risk of overweight: a meta-analysis. *American Journal of Epidemiology, 162*, 397–403.

Hossain, M.M, Radwan, M.M, Arafa, S.A., Habib, M. & DuPont, H.L (1992). Prelacteal Infant Feeding Practices in Rural Egypt. *Journal of Tropical Pediatrics, 38*(6), 317-322.

Helsedirektoratet. (2011). *Hvordan du ammer ditt barn-Noen råd den første tiden* (Veileder IS-2092/2011). Retrived 08.10.2013 from http://helsedirektoratet.no/publikasjoner/hvordan-du-ammer-ditt-barn-hefte-is-2092/Publikasjoner/hvordan-du-ammer-ditt-barn.pdf

Henjum, S., Barikmo, I., Gjerlaug, A.K., Mohamed-Lehabib, A., Oshaug, A., Strand, T.A. & Torheim, L.E. (2010). Endemic goitre and excessive iodine in urine and drinking water among Saharawi refugee children. *Public Health Nutrition, 10*, 1017.

Henjum, S., Barikmo, I., Strand, T.A., Oshaug, A. & Torheim, L.E. (2012). Iodine-induced goitre and high prevalence of anaemia among Saharawi refugee women. *Public Health Nutrition, 15*, 1512-1518.

Human Rights Watch. (2008). *Human rights in Western Sahara and in the Tindouf Refugee Camps Morocco/Western Sahara/Algeria.* New York: HRW.

Hörnell, A., Aarts, C., Kylberg, E., Hofvander, Y. & Gebre-Medhin, M. (1999). Breastfeeding patterns in exclusively breastfed infants: a longitudinal prospective study in Uppsala, Sweden. *Acta Paediatrica*, *88*(2), 203–211.

International Labour Organisation. (2000). *Maternity Protection Convention no.183*. Geneva: ILO.

Kent, J. C, Mitoulas, L.R., Cregan, M.D., Ramsay, D.T., Doherty, D.A. & Hartmann, P.E. (2006). Volume and Frequency of Breastfeedings and Fat Content of Breast Milk Throughout the Day. *Pediatrics, 117*(3), 387-395.

Kishore, S. & Garg, B.S. (1999). Practice of prelacteal feeding in a rural community. *Indian Journal of Public Health, 43*(4), 144-147.

Khadivzadeh, T. & Parsa, S. (2004). Effect of exclusive breastfeeding and complementary feeding on infant growth and morbidity. Eastern Mediterranean Health Journal, 10(3), 289-294.

Li, R., Darling, N, Maurice, E., Barker, L & Grummer-Strawn, L.M. (2005). Breastfeeding Rates in the United States by Characteristics of the Child, Mother, or Family: The 2002 National Immunization Survey. *Pediatrics, 15*(1), 31-37.

Martin, R.M., Ebrahim, S., Griffin, M., Davey Smith, G., Nicolaides, A.N., Georgiou, N., …Gunnell D. (2005). Breastfeeding and atherosclerosis: intima media thickness and plaques at 65-year follow-up of the Boyd Orr Cohort. *Arteriosclerosis Thrombosis Vascular Biology, 25*, 1482–1488.

Martin, R.M., Gunnell, D. & Smith, D.G. (2005). Breastfeeding in infancy and blood pressure in later life: systemic review and meta-analysis. *American Journal of Epidemiology, 161*, 15–26.

Martorell, R., Habicht J.P. & Rivera J.A. (1995). History and design of the INCAP longitudinal study (1969–1977) and its follow-up (1988–1989). *The Journal of Nutrition, 125,* 1027–1041.

Mitra, A.K., Khoury, A.J., Hinton, A.W. & Carothers, C. 2004). Predictors of Breastfeeding Intention Among Low-Income Women. *Maternal and Child Health Journal, 8*(2), 65-70.

Nelson, M. (1997). The validation of dietary assessment. In M. B. Margetts & M. Nelson (Eds.), *Design concepts in Nutritional Epidemiology* (2 ed.). New York: Oxford University Press.

Neville, M. C., Keller, R, Seacat, J, Lutes, V., Neifert, M., Casey, C., … Archer, P. (1988). Studies in human lactation: milk volumes in lactating women during the onset of lactation and full lactation. *American Journal of Clinical Nutrition, 48*(6), 1375-1386.

Norwegian Church Aid, Akershus University College & Saharawi Ministry of Health. (2005). *Base-line and assessment study of the nutritional situation in two regions in the Saharawi Refugee Camps, Tindouf, Algeria*. Norway: NCA,
AUC, Saharawi Ministry of Health.

de Onis, M., Onyango, A., W., Borghi, E., Garza, C. & Yang, H. (2006). *Comparison of the World Health Organization (WHO) ChildGrowth Standards and the National Center for Health Statistics/WHO international growth reference: implications for child health programmes.* Public Health Nutrition, *9*(7), 942–947.

Owen, C.G., Whincup, P.H., Odoki, K., Gilg, J.A & Cook, D.G. (2002) Infant feeding and blood cholesterol: a study in adolescents and a systematic review. *Pediatrics, 110*,597–608.

Riva, E., Banderali, G., Agostini, C., Silavo, M, Radaelli, G & Giovannini, M. (2007). Factors associated with initiation and duration of breastfeeding in Italy. *Acta Paediatrica, 88*(4), 411-415.

Robenblatt, K. & Thomas, D. (1993). Lactation and the risk of epithelial ovarian cancer. *International Journal of Epidemiology*, *22*, 192–197.

Ryan, A.S. (1997). The Resurgence of Breastfeeding in the United States. *Pediatrics. 99*(4),1.

Sadeharju, S., Knip, M., Virtanen, S.M., Savilahti, E., Tauriainen, S., Koskela, P.,…the Finnish TRIGR Study Group. (2007). Maternal Antibodies in Breast Milk Protect the Child From Enterovirus Infections. *Pediatrics, 119*, 941.

Scott, J.A. Aitkin, I., Binns, C.W. & Aroni, R.A.(2007). Factors associated with the duration of breastfeeding amongst women in Perth, Australia. *Acta Paediatric,. 88*(4), 416-421.

Scott, J.A., Binns, C.W, Oddy, W.H & Graham, K.I. (2006). Predictors of Breastfeeding Duration: Evidence From a Cohort Study. *Pediatrics*, *117*(4), 646-655.

Seal, A.J., Creeke, P.I., Gnat, D., Abdalla, F. & Mirghani, Z. (2006). Excess dietary iodine intake in long-term African refugees. *Public Health Nutrition*, *9*, 35-39.

Sachdev, H.P.S., Krishna, J., Puri, R.K, Satyanarayana, L. & Kumar, S. (1991). Water supplementation in exclusively breastfed infants during summer in the tropics. *The Lancet 8747*(1), 929-933.

Shrimpton, R,. Victora, C. G., de Onis, M., Costa Lima, R., Blössner, M. & Clugston, M. (2001). Worldwide Timing of Growth Faltering: Implications for Nutritional Interventions. *Pediatrics, 107,* 75.

Singh, G.K, Kogan, M.D & Dee, D.L. (2007). Nativity/Immigrant Status, Race/Ethnicity, and Socioeconomic Determinants of Breastfeeding Initiation and Duration in the United States, 2003. *Pediatrics, 119,* 38-46.

Soriano, J.M., Domènech, G., Mañes, J., Catalá-Gregori, A.I. & Barikmo, I.E. (2011). Disorders of malnutrition among the Saharawi children Review Article. *Revista Española de Nutrición Humana y Dietética, 15,* 10-19.

Subramanian, S. V., Özaltin, E. & Finlay, J.E., (2011). Height of Nations: A Socioeconomic Analysis of Cohort Differences and Patterns among Women in 54 Low- to Middle-Income Countries. *PLoS ONE, 6*(4), 18962.

Sidney**,** K., Diwan, V., El-Khatib Z. & de Costa, A. (2012)**.** India's JSY cash transfer program for maternal health: Who participates and who doesn't - a report from Ujjain district. *Reproductive Health 2012, 9*(2).

The Norwegian Support Committee for Western Sahara. (2007). *Africa's last colony.* Retrieved 14.05.2013 from http://www.vest-sahara.no/a51x0
United Nations. (2012).*The millennium development goals report 2012*. New York: UN.

United Nations. (2013). *Millennium development goals and beyond 2015- fact sheet.* Retrieved 09.10.1013 from http://www.un.org/millenniumgoals/pdf/Goal_5_fs.pdf

United Nations Children's Fund. (2007). *Protecting Breatfeeing in West and Central Africa. 25 Years Implementing the International Code of Marketing of Breastmilk Substitutes.* UNICEF.

United Nations Children's Fund. (2013*). Committing to Child Survival: A promise Renewed. Progress report 2012.* New York: UNICEF.

United Nations Children's Fund, World Health Organisation, United Nations Education, Scientific and Cultural Organization, United Nation Population Fund, United Nations Development Programme, Joint United Nations Programme on HIV and AIDS, World Food Programme & the World Bank. (2010). *Facts for life* (4 ed). New York: UNICEF.

United Nations High Commissioner for Refugees & United Nations World food programme. (2011). *Nutrition Survey Western Sahara Refugee Camps, Tindouf, Algeria- Report on Nutrition Survey and Anaemia Intervention Baseline Analysis.* UNHCR & the WFP.

Wamani**,** H., Åstrøm, A.M**,** Peterson,S., Tumwine, J.K. & Tylleskär, T. (2007). Boys are more stunted than girls in Sub-Saharan Africa: a meta-analysis of 16 demographic and health surveys. *BMC Pediatrics. 7*(17).

Van de Perre, P. (2003). Transfer of antibody via mother's milk. *Vaccine, 21*, 3374–3376.

Victora, C.G., de Onis, M., Hallal, P.C., Blössner, M. & Shrimpton, R. (2010). Worldwide timing of growth faltering: revisiting implications for interventions. *Pediatrics. 125*(3), 473-480.

World Food Programme, & United Nations High Commissioner for Refugees. (2007). *UNHCR/ WFP joint assessment mission- Assistance to refugees from Western Sahara*. Rome: WFP & UNHCR.

World Health Organisation. (1995). *Physical status: the use and interpretation of anthropometry*. Geneva: WHO.

World Health Organisation. (1997). *Global Database on Child Growth and Malnutrition*. Retrieved 12.11.2013 from http://whqlibdoc.who.int/hq/1997/WHO_NUT_97.4.pdf

World Health Organisation. (2000). Collaborative Study Team on the Role of Breastfeeding on the Prevention of Infant Mortality, Effect of breastfeeding on infant and childhood mortality due to infectious diseases in less developed countries: a pooled analysis. *Lancet, 355*, 451–455.

World Health Organisation. (2002). *Nutrient adequacy of exclusive breastfeeding for the term infant during the first six months of life*. Geneva: WHO.

World Health Organisation. (2006). *WHO Child Growth Standards. Length/height-for age, weight-for -age, weight-for-length, weight-for-height and body mass index-for-age. Methods and Development*. Geneva: WHO.

World Health Organisation. (2009). *Infant and young child feeding. Model Chapter for textbooks for medical students and allied health professionals.* Geneva: WHO.

World Health Organisation. (2010). *Guidelines on HIV and infant feeding. Principles and recommendations for infant feeding in the context of HIV and a summary of evidence*. Geneva: WHO.

World Health Organisation. (2011). *Global Database on Body Mass Index*. Retrieved 14.03.2013 from http://apps.who.int/bmi/index.jsp?introPage=intro_3.html

World Health Organisation & United Nations Children's Fund. (1990). *Innocenti declaration: On the protection, promotion and support of breastfeeding.* Retrieved 16.04.2013 from http://www.unicef.org/programme/breastfeeding/innocenti.htm

World Health Organisation & United Nations Children's Fund. (1991). *The Baby-Friendly Hospital Initiative*. Retrieved 16.04.2013 from http://www.unicef.org/programme/breastfeeding/baby.htm

World Health Organisation & United Nations Childrens Fund. (2004). *Low birthweight: Country, regional and global estimates.* New York: WHO & UNICEF.

World Health Organisation & United Nations Childrens Fund. (2007a). *Indicators for assessing infant and young child feeding practices. Part 1 Definition*: World Health Organisation, UNICEF.

World Health Organisation, & United Nations Childrens Fund. (2007b). *Innocenti Declaration 2005 on Infant and Young Child Feeding.* WHO & UNICEF.

World Health Organisation & United Nations Children's Fund. (2009). *The Baby-Friendly Hospital Initiative Revised, Updated and Expanded for Integrated Care*. WHO & UNICEF.

World Health Organisation, & United Nations Childrens Fund. (2010a). *Indicators for assessing infant and young child feeding practices PART 1 .Measurements*. WHO & UNICEF.

World Health Organisation, & United Nations Childrens Fund. (2010b). *Indicators for assessing infant and young child feeding practices PART 3 Countrtry prprofiles*. WHO & UNICEF.

Zere, E. & McIntyre, D.(2003). Inequities in under-five child malnutrition in South Africa. *International Journal of Equity in Health, 2,* 7.

Attachment 1

UNIVERSITETET I OSLO
DET MEDISINSKE FAKULTET

Høgskolelektor Ingrid Barikmo
Høgskolen i Akershus
Postboks 423
2001 Lillestrøm

Regional komité for medisinsk og helsefaglig forskningsetikk Sør-Øst C (REK Sør-Øst C)
Postboks 1130 Blindern
NO-0318 Oslo

Telefon: 22 84 46 67

E-post: post@helseforskning.etikkom.no
Nettadresse: http://helseforskning.etikkom.no

Dato: 21.12.2010.
Deres ref.:
Vår ref.: 2010/2513 (oppgis ved henvendelse)

Struma blant flyktninger

Vi viser til søknad om forhåndsgodkjenning av ovennevnte forskningsprosjekt. Søknaden er blitt vurdert av Regional komité for medisinsk og helsefaglig forskningsetikk i henhold til lov av 20. juni 2008 nr. 44, om medisinsk og helsefaglig forskning (helseforskningsloven) kapittel 3, med tilhørende forskrift om organisering av medisinsk og helsefaglig forskning av 1. juli 2009 nr 0955.

Flyktninger fra Vest Sahara har siden landet ble okkupert av Marokko i 1975, vært omplassert til flyktningeleire i det sørvestlige Algerie. I dag bor ca. 165 000 flyktninger i fire leire i Tindouf provinsen; El Aiune, Ausserd, Smara og Dakla. To masterstudenter fra Høgskolen i Akershus vil i samarbeid med Kirkens Nødhjelp og på oppdrag fra myndigheter i Vest Sahara gjennomføre en kostholdsstudie i disse leirene i løpet av oktober til desember 2010. Det primære formålet med studien er å undersøke det høye inntaket av jod som er oppdaget blant flyktningene, og se hvilke konsekvenser dette har i populasjonen i leirene. Søknaden er kommet inn som en prosjektendringssøknad, og oppfattes å være en delstudie av prosjektet ***Struma blant flyktninger.***

Prosjektleder: Ingrid Barikmo
Forskningsansvarlig: Høgskolen i Akershus

Saksgang
Søknaden ble først forelagt komiteen som en prosjektendringsmelding 29.09.2010. Komiteens leder vurderte endringsmeldingen på delegert fullmakt, og kom til at studieutvidelsen var å betrakte som et nytt, selvstendig prosjekt. Søker ble orientert om dette 10.11.2010. Prosjektet ble således behandlet i fullt komitémøte 06.12.2010.

Forskningsetisk vurdering
Studien skal gjennomføres i et landområde hvis status er å betrakte som uavklart, dog ikke fra norsk side. Komiteen viser til vedlagt dokumentasjon, og forutsetter at de nødvendige tillatelser fra Vest-Sahara foreligger.

Vedtak:
Prosjektet godkjennes.

Tillatelsen er gitt under forutsetning av at prosjektet gjennomføres slik det er beskrevet i søknaden og protokollen, og de bestemmelser som følger av helseforskningsloven med forskrifter.

Tillatelsen gjelder til 31.12.2012. Opplysningene skal deretter slettes eller anonymiseres, senest innen et halvt år fra denne dato. Prosjektet skal sende sluttmelding på eget skjema, jf. helseforskningsloven § 12, senest et halvt år etter prosjektslutt.

Attachment 2-5

Quesrionnaire 1- Background information

Iodine survey in the Saharawi camps November-December 2010

Background questionnaire to the women

1. **Date**... ..... ☐☐.☐☐.☐☐
2. **Id number woman-**..... .....☐☐☐-☐
3. **Id number child** ....☐☐☐-☐
4. **Camp**.... ....☐☐
   1=27. February, 2=Smara, 3=Auserd, 4=Dajla, 5=Aaiun
5. **Daira**..(write)_____☐☐
   (Daira according to a list)
6. **Barrio** (write)_____☐☐

   (Barrio according to a list)

---

7. **Name of the interviewer**_____
8. **Time of the interview**: .....a) start ☐☐-☐☐ ..... b) stop ☐☐-☐☐

Ask the following questions to the mother:

9. How old are you? ....☐☐ years
10. Marital status: ....☐☐
    0=Not married, 1=Married, 2=Divorced, 3=Widowed
11. Have you lived in different Saharawi refugee camps?..... .....☐☐
    0=No, 1=Yes

If YES

11.1.a) Which camp_____**11.1.b)** Period_____

11.2.a) Which camp_____**11.2.b)** Period_____

11.3.a) Which camp_____**11.3.b)** Period_____

12. Have you lived in other areas outside the Saharawi refugee camps? ..... ☐☐
0=No, 1=Yes

If YES

12.1.a) Which area_____**12.1.b)** Period_____

12.2.a) Which area_____**12.2.b)** Period_____

12.3.a) Which area_____**12.3.b)** Period_____

13. How long education do you have..... ..... ☐☐
0=None, 1=Less than 6th grade, 2= 6th grade, 3=7 to 9th grade, 4=10 to 12th grade, 5=Higher education

14. Have you attended any courses in the refugee camps?..... ..... ☐☐
0=No, 1=Yes

If YES

14.1.a) Which_____**14.1.b)** How long_____

14.2.a) Which_____**14.2.b)** How long_____

15. What language do you speak, read or write? (mark with X)

15.1.a) Hasanía ..... **15.1.b)** speak ☐

15.2.a) Arabic..... **15.2.b)** speak ☐ ..... **15.2.c)** read ☐ ..... **15.2.d)** write ☐

15.3.a) Spanish ..... **15.3.b)** speak ☐ ..... **15.3.c)** read ☐ ..... **15.3.d)** write ☐

15.4.a) Other (which?)..... **15.4.b)** speak ☐ ..... **15.4.c)** read ☐ ..... **15.4.d)** write ☐

16. Are you working outside the home at the moment? .... ☐☐
0=No, 1=Yes

If YES

16.1 with what?_____

17. How many people live in this household here and now (count those at 12october school in the area but not those that are abroad or other places in Algeria)? ..... ☐☐

18. Gender of Head of household .... ☐☐
0=Man, 1=Woman

19. Age of Head of household..... ..... ☐☐ years

20. How many children do you have?

20.1.a) alive ..... ☐☐ **20.1.b)** dead ..... ☐☐

21. How many children are under 5 years? .... ☐☐

Questionnaire 2- breast feeding practices

Iodine survey in the Saharawi camps April-July 2013

Breast feeding practises

1. Date .... ☐☐.☐☐.☐☐

2. Id number mother ..... ☐☐☐-☐

3. Id number child ..... ☐☐☐-☐

4. Camp.... ..... ☐☐
1=27.Febrero, 2= Smara, 3= Auserd, 4=Dajla, 5=Aaiun

5. Daira (write)_____ ☐☐
(According to the list)

6. Barrio (escribir)_____
(According to a list)

---

7. Name of interviewer _____

8. Time the interview:.....a) start ☐☐-☐☐ ..... b) stop ☐☐-☐☐

Questions for the mother:

9. Gender of the child ..... ☐☐
0=Male, 1=Female

10. How old is the child?..... ☐☐ months

11. When was the child born..... ☐☐.☐☐.☐☐ date

12. Where was the child born..... ☐☐
1= At home, 2=In dispensario, 3= hospital in the camp, 4=Hospital in Rabouni, 5= Hospital in Tindouf

13. What was the weight of the child when it was born? ..... ☐☐☐☐ grams
13.1..... Is the weight given verbal of from health card? ..... ☐☐
0= Verbal, 1= Health card

14. How long was the baby when it was born? ..... ☐☐ cm
14.1..... Is the height given verbal or from health card? ..... ☐☐
0=Verbal, 1= Health card

15. Have your child had diarrhoea during the last two weeks? .. ☐☐

0= No, 1= Yes

16. Have your child have any other disease during the last two weeks?..... ☐☐
0=No, 1=Yes
If yes: Which? (write)_____

17. Have you given any medicine to your child the last two weeks? ..... ☐☐
0=No, 1=Yes

If Yes: What kind of medicine?

17.1..... Nature medicine .... ☐☐
0=No, 1=Yes
If yes: What type of medicine? (write)_____

17.2.. Hospital/ doctors medicine..... ..... ☐☐
0=No, 1=Yes
If yes: What kind of medicine? (write)_____

18. How long time after birth did you start breast feeding this child? ..... ☐☐
1=within the first hour, 2=within the first 6 hours, 3=within the next 6 hours (the first day), 4=within the second day, 5=within the third day, 6=other (How long)_____

19. Did you give your child anything else to drink than breast milk, before you started breastfeeding it for the first time?..... ..... ☐☐
0=No, 1=Yes

If yes: What did you give?

19.1..... Sugar water..... ..... ☐☐
0=No, 1=Yes
If yes:
19.1.1. What kind of water..... ..... ☐☐
1=Public water, 2=bottled water, 3=from my own well
19.1.2. Did you boil the water before giving it?..... ..... ☐☐
0=No, 1= Yes

19.2..... Oil water .... ☐☐
0=No, 1=Yes
If yes:
19.2.1. What kind of water?..... ..... ☐☐
1=Public water, 2=bottled water, 3=from my own well
19.2.2. Did you boil the water before giving it?..... ..... ☐☐
0= No, 1= Yes

19.3..... Milk or milk mixed with water..... ..... ☐☐
0=No, 1=Yes
If yes:
19.3.1. What type of milk did you give?..... ..... ☐☐

1=Goat milk, 2= Camel milk, 3= Candia milk, 4=Formula

19.3.2. Did you boil the milk or mix before giving it?.... ☐☐
0= No, 1= Yes

19.4.…. Other drink, what? (write)_____

20. How do you usually breastfeed your child …… ..... ☐☐
1=on demand, 2=at fixed intervals, 3=both

21. How many times during the DAY yesterday did you breast feed your child? ..... ☐☐
0= no times, 1=1-5 times, 2= 6-10 times, 3=11-15 times, 4=All the time

21.1.…. Was this a normal day? ……. ..... ☐☐
0=No, 1=Yes

If no:

21.1.1. Why not? (Write)_____

21.1.2. How many times would you breast feed your child on a normal day? ☐☐
0= no times, 1=1-5 times, 2= 6-10 times, 3=11-15 times, 4=All the time

22. How many times during the NIGHT to today did your breast feed your child?..... ..... ☐☐
0= no times, 1=1-5 times, 2= 6-10 times, 3=11-15 times, 4=All the time

22.1.…. Was this a normal night? .... ☐☐
0=No, 1=Yes

If no:

22.1.1. Why Not (Write)_____

22.1.2. How many times would you breast feed your child on a normal night? ☐☐
0= no times, 1=1-5 times, 2= 6-10 times, 3=11-15 times, 4=All the time

Tell the mother this: There will now be a section with questions about foods and drinks you might have given your child. First we ask about how many times *yesterday* you gave the certain food or drink. Yesterday means the 24 hours from your child woke up yesterday morning until it woke up today. If you did not give that food or drink yesterday, you can answer no times. Than we ask about how many times the last week, 7 days and nights, you gave the food or drink. If you did not give the food or drink the last week you answer no times and we go to the next food question. Please try to remember back as accurate as possible.

To the nutritionists: You have to ask the mother about how many times, during the last 24 hours yesterday, she gave food or drinks. And write down this answer. Then you ask about

the last week, and write this answer down. The 24 hours is separated from the week, and should not be included in the answer.

23. How many times did you give your child any of the following foods and drinks:

Sugar water

23.1. …. Times yesterday (day and night)..... ☐☐ times

23.2. …. Times the last week (7 days and nights)..... ☐☐ times

If yes:

23.2.1. What kind of water..... ☐☐ water

1=Public water, 2=bottled water, 3=from my own well

23.2.2. The last time you gave sugar water, did you boil the water before giving it? ..... ☐☐

0= No, 1= Yes

Oil water

23.3. …. Yesterday, during the day and night(24 hours) ..... ☐☐ times

23.4. …. Times the last 7 days AND nights (week)..... ☐☐ times

If yes:

23.4.1. What kind of water..... ☐☐ water

1=Public water, 2=bottled water, 3=from my own well

23.4.2. The last time you gave oil water, did you boil the water before giving it? ..... ☐☐

0= No, 1= Yes

Formula

23.5. …. Yesterday, during the day and night (24 hours) ..... ☐☐ times

23.6. …. Times the last 7 days AND nights (week)..... ☐☐ times

If yes:

23.6.1. What kind of water..... ☐☐ water

1=Public water, 2=bottled water, 3=from my own well

23.6.2. The last time you gave formula, did you boil it before giving it?..... ☐☐

0= No, 1= Yes

Goat milk or goat milk mixed with water

23.7. …. Times yesterday (the day and night) ..... ☐☐ times

23.8. …. Times the last week (7 days and nights)..... ☐☐ times

If yes:

23.8.1. The last time you gave goat milk or mixed goat milk, did you boil it before giving it?.... ☐☐

0= No, 1= Yes

Camel milk or camel milk mixed with water

23.9. …. ……Times yesterday (the day and night)..... ☐☐ times

23.10. .. Times the last week (7 days and nights)..... ☐☐ times

If yes:

23.10.1. The last time you gave camel milk or mixed camel milk, did you boil it before giving it? ☐☐

0= No, 1= Yes

Cadida milk or cadida milk mixed with water

23.11. .. Times yesterday (the day and night) .... ☐☐ times

23.12. .. Times the last week (7 days and nights) .... ☐☐ times

If yes:

23.12.1 The last time you gave cadida milk or cadida milk mixed with water, did you boil it before giving it? ☐☐

0= No, 1= Yes

Dates

23.13. .. Times yesterday (the day and night) .... ☐☐ times

23.14. .. Times the last week (7 days and nights) .... ☐☐ times

Soup

23.15. .. Times yesterday (the day and night) .... ☐☐ times

23.16. .. Times the last week (7 days and nights) .... ☐☐ times

Porridge

23.17. .. Times yesterday (the day and night) .... ☐☐ times

23.18. .. Times the last week (7 days and nights) .... ☐☐ times

Bread

23.19. .. Times yesterday (the day and night) .... ☐☐ times

23.20. .. Times the last week (7 days and nights) .... ☐☐ times

Eggs

23.21. .. Times yesterday (the day and night) .... ☐☐ times

23.22. .. Times the last week (7 days and nights) .... ☐☐ times

Vegetables (for example: carrot, potato, onion, tomatoes, etc.)

23.23. .. Times yesterday (the day and night) .... ☐☐ times

23.24. .. Times the last week (7 days and nights) .... ☐☐ times

If yes, what kind (write)_____

Fruits (for example: banana, orange, apples, pears, etc.)

23.25. .. Times yesterday (the day and night) .... ☐☐ times

23.26. .. Times the last week (7 days and nights) .... ☐☐ times

If yes, what kind (write)_____

Juice

23.27. .. Times yesterday (the day and night) .... ☐☐ times

23.28. .. Times last week (7 days and nights) .... ☐☐ times

Sweets (for example: muffins, biscuits, etc.)

23.29. .. Times yesterday (the day and night) .... ☐☐ times

23.30. .. Times the last week (7 days and nights) .... ☐☐ times

Lenses

23.31. .. Times yesterday (the day and night) .... ☐☐ times

23.32. .. Times the last week (7 days and nights) .... ☐☐ times

Rice

23.33. .. Times yesterday (the day and night) .... ☐☐ times

23.34. .. Times the last week (7 days and nights) .... ☐☐ times

Other, what (write)_____

23.35. .. Times yesterday (the day and night) .... ☐☐ times

23.36. .. Times the last week (7 days and nights) .... ☐☐ times

24. How old was the child when you first introduced it to solid or semi-solid foods, like bread, rice, fruit, porridge, etc? .... ☐☐ months

25. How old will the child be when you plan to stop breast feed it? ..... ☐☐ months

26. Did you eat like normal when you were pregnant with this child? ..... ☐☐
1=Yes, 2=I ate more, 3= I ate less

27. Did you go to controls at the health centres or hospitals when you were pregnant with this child .. ☐☐
0=No, 1=Yes

27.1. .... If yes: How many times..... ..... ☐☐ times

Questionnaire 3- 24 hour recall and 7 day recall

Iodine survey in the Saharawi camps November – December 2010

24 hour and 7 days recall on milk and water intake among women

22. Date .... ☐☐.☐☐.☐☐

23. Id number woman..... .....☐☐☐-☐

24. Id number child ....☐☐☐-☐

25. Camp.... ....☐☐

1=27.February, 2=Smara, 3= Auserd, 4=Dajla, 5=Aaiun

26. Daira (write)_____☐☐

(Daira according to a list)

27. Barrio (write)_____ ☐☐

(Barrio according to a list)

---

28. Name of the interviewer_____

29. Time of the interview:.....a) start ☐☐-☐☐ ..... b) stop ☐☐-☐☐

Information to the mothers (read): In this questionnaire, we will ask you about your consumption of milk, water, tea and soup during the last 7 days and yesterday is the last 24 hours, which refer to food and drink consumed from the time you woke up yesterday until the time you woke up today. We will start with milk and continue with the other foods and drinks.

MILK

30. Did you drink any of the following milk types the last 7 days? (Ask all milk types)

9.1 Goat milk..... ..... ☐☐

0=No, 1=Yes

9.2 Camel milk .... ☐☐

0=No, 1=Yes

9.3 Candia milk..... ..... ☐☐

0=No, 1=Yes

9.4 Powder milk .... ☐☐

0=No, 1=Yes

9.5 Other milk .... ☐☐

0=No, 1=Yes

If NO on all the questions above, go to Question 30.

If YES on any of the questions above, continue with the questions according to the milk type they have consumed (10-29).

Goat milk

31. How was the distribution of milk and water?..... ☐☐☐☐ gram milk ☐☐☐☐ gram water

32. How much goat milk did you drink in total pr. day each of the last 7 days?

a) Yesterday (Day 1)..... ..... ☐☐☐☐ gram

b) Day before yesterday (Day 2) .... ☐☐☐☐ gram

c) Day 3 ..... ☐☐☐☐ ..... gram

d) Day 4 ..... ☐☐☐☐ ..... gram

e) Day 5 ..... ☐☐☐☐ ..... gram

f) Day 6. ..... ☐☐☐☐ ..... gram

g) Day 7 ..... ☐☐☐☐ ..... gram

33. Where did you get the goat milk? .... ☐☐

*1=From my own household, 2=I bought it/got it (**Note**:Use the day that is coming first on the list of days)*

If you bought it/got it,

12.1 Where did you buy/get the goat milk? (write)_____

34. Is this the amount of goat milk you usually drink in a week? ☐☐

0=No, 1=Yes

If NO,

13.1 Why not? (write)_____

Camel milk

35. How was the distribution of milk and water?..... ☐☐☐☐ gram milk ☐☐☐☐ gram water

36. How much camel milk did you drink in total pr. day each of the last 7 days?

a) Yesterday (Day 1)..... ..... ☐☐☐☐ gram

b) Day before yesterday (Day 2)..... ..... ☐☐☐☐ gram

c) Day 3 ..... ☐☐☐☐ ..... gram

d) Day 4 ..... ☐☐☐☐ ..... gram

e) Day 5 ..... ☐☐☐☐ ..... gram

f) Day 6. ..... ☐☐☐☐ ..... gram

g) Day 7 ..... ☐☐☐☐ ..... gram

37. Where did you get the camel milk? .... ☐☐

*1=From my own household, 2=I bought it/got it (**Note**:Use the day that is coming first on the list of days)*

If you bought it/got it,

15.1 Where did you buy/get the camel milk? (write)_____

38. Is this the amount of camel milk you usually drink in a week? ..... ☐☐

0=No, 1=Yes

If NO,

16.1 Why not? (write)_____

Candia milk

39. How was the distribution of milk and water?..... ☐☐☐☐ gram milk ☐☐☐☐ gram water

40. How much Candia milk did you drink in total pr. day each of the last 7 days?

a) Yesterday (Day 1)..... ..... ☐☐☐☐ gram

b) Day before yesterday (Day 2)..... ..... ☐☐☐☐ gram

c) Day 3 ..... ☐☐☐☐ ..... gram

d) Day 4 ..... ☐☐☐☐ ..... gram

e) Day 5 ..... ☐☐☐☐ ..... gram

f) Day 6. ..... ☐☐☐☐ ..... gram

g) Day 7 ..... ☐☐☐☐ ..... gram

41. Where did you get the Candia milk? .... ☐☐

*1=From my own household, 2=I bought it/got it (**Note**:Use the day that is coming first on the list of days)*

If you bought it/got it,

19.1 Where did you buy/get the Candia milk? (write)_____

42. Is this the amount of Candia milk you usually drink in a week?..... ☐☐

0=No, 1=Yes

If NO,

20.1 Why not? (write)_____

Powder milk

43. How was the distribution of milk and water?..... ☐☐☐☐ gram milk ☐☐☐☐ gram water

44. How much powder milk did you drink in total pr. day each of the last 7 days?

a) Yesterday (Day 1)..... ..... ☐☐☐☐ gram

b) Day before yesterday (Day 2) .... ☐☐☐☐ gram

c) Day 3 ..... ☐☐☐☐ ..... gram

d) Day 4 ..... ☐☐☐☐ ..... gram

e) Day 5 ..... ☐☐☐☐ ..... gram

f) Day 6. ..... ☐☐☐☐ ..... gram

g) Day 7 ..... ☐☐☐☐ ..... gram

45. Where did you get the powder milk? .... ☐☐

*1=From my own household, 2=I bought it/got it (**Note**:Use the day that is coming first on the list of days)*

If you bought it/got it,

23.1 Where did you buy/get the powder milk? (write)_____

46. Is this the amount of powder milk you usually drink in a week? ..... ☐☐

0=No, 1=Yes

If NO,

24.1 Why not? (write)_____

Other milk

47. How was the distribution of milk and water?..... ☐☐☐☐ gram milk ☐☐☐☐ gram water

48. How much other milk did you drink in total pr. day each of the last 7 days?

a) Yesterday (Day 1) .... ☐☐☐☐ gram

b) Day before yesterday (Day 2) .... ☐☐☐☐ gram

c) Day 3 ..... ☐☐☐☐ ..... gram

d) Day 4 ..... ☐☐☐☐ ..... gram

e) Day 5 ..... ☐☐☐☐ ..... gram

f) Day 6. ..... ☐☐☐☐ ..... gram

g) Day 7 ..... ☐☐☐☐ ..... gram

49. Where did you get the other milk? .... ☐☐

*1=From my own household, 2=I bought it/got it (**Note**:Use the day that is coming first on the list of days)*

If you bought it/got it,

27.1 Where did you buy/get the powder milk? (write)_____

50. Is this the amount of other milk you usually drink in a week? ..... ☐☐

0=No, 1=Yes

If NO,

28.1 Why not? (write)_____

WATER

51. Did you drink water the last 7 days? .... ☐☐

0=No, 1=Yes

If NO, go to Question 34.

If YES, continue with the questions below.

52. How much water did you drink in total pr. day each of the last 7 days?

a) Yesterday (Day 1)..... ..... ☐☐☐☐ gram

b) Day before yesterday (Day 2)..... ..... ☐☐☐☐ gram

c) Day 3 ..... ☐☐☐☐ ..... gram

d) Day 4 ..... ☐☐☐☐ ..... gram

e) Day 5 ..... ☐☐☐☐ ..... gram

f) Day 6. ..... ☐☐☐☐ ..... gram

g) Day 7 ..... ☐☐☐☐ ..... gram

53. From where did you get the drinking water .... ☐☐

*1= Public water, 2= Water from own well, 3= Sweet water, 4= Bottled water, 4= Other water (**Note**: Use the day that is coming first on the list of days)*

54. Is this the amount of water you usually drink in a week? ..... ☐☐

0=No, 1=Yes

If NO,

33.1 Why not? (write)_____

TEA

55. Did you drink tea the last 7 days?..... .....☐☐

0=No, 1=Yes

If NO, go to Question 38

If YES, continue with the questions below.

56. How much tea did you drink in total pr. day each of the last 7 days?

a) Yesterday (Day 1)..... .....☐☐☐☐ gram

b) Day before yesterday (Day 2) ....☐☐☐☐ gram

c) Day 3 .....☐☐☐☐..... gram

d) Day 4 .....☐☐☐☐..... gram

e) Day 5 .....☐☐☐☐..... gram

f) Day 6. .....☐☐☐☐..... gram

g) Day 7 .....☐☐☐☐..... gram

57. From where did you get the tea water ....☐☐

*1= Public water, 2= Water from own well, 3= Sweet water, 4= Bottled water, 4= Other water (**Note**: Use the day that is coming first on the list of days)*

58. Is this the amount of tea you usually drink in a week? ....☐☐

0=No, 1=Yes

If NO,

37.1 Why not? (write)_____

SOUP

59. Did you eat soup the last 7 days? .... ☐☐

0=No, 1=Yes

If YES, continue with the questions below.

60. How much soup did you eat in total pr. day each of the last 7 days?

a) Yesterday (Day 1)..... ..... ☐☐☐☐ gram

b) Day before yesterday (Day 2) .... ☐☐☐☐ gram

c) Day 3 ..... ☐☐☐☐ ..... gram

d) Day 4 ..... ☐☐☐☐ ..... gram

e) Day 5 ..... ☐☐☐☐ ..... gram

f) Day 6. ..... ☐☐☐☐ ..... gram

g) Day 7 ..... ☐☐☐☐ ..... gram

61. Is this the amount of soup you usually eat in a week?..... ..... ☐☐

0=No, 1=Yes

If NO,

39.1 Why not? (write)_____

Thank you for your time and for answering our questionnaire ☺

Questionnaire 4- Sample and measurement

Iodine survey in the Saharawi camps November – December 2010

Samples and measurements of mother and child

62. Date .... ☐☐.☐☐.☐☐

63. Id number woman..... ..... ☐☐☐-☐

64. Id number child .... ☐☐☐-☐

65. Camp.... .... ☐☐

1= 27.February, 2=Smara, 3= Auserd, 4=Dajla, 5=Aaiun

66. Daira (write)_____ ☐☐

(Daira according to a list)

67. Barrio (write)_____ ☐☐

(Barrio according to a list)

Anthropometric measurements

68. What is the weight of the mother?..... ..... ☐☐,☐ kg

7.1 What is the weight of the clothes ☐ ½ kg, ☐ 1 kg, ☐ 2 kg

69. What is the height of the mother?..... ..... ☐☐☐,☐ cm

70. What is the weight of the child? .... ☐☐,☐ kg

71. What is the height of the child? .... ☐☐☐,☐ cm

Urine samples

72. Is urine sample from the mother collected?..... ..... ☐☐

0=No, 1=Yes

73. Is urine sample from the child collected? .... ☐☐

0=No, 1=Yes

Blood samples

74. Is blood sample from the mother collected? .... ☐☐

0=No, 1=Yes

75. Is blood sample from the child collected? .... ☐☐

0=No, 1=Yes

Breast milk sample

76. Is breast milk sample from the mother collected? .... ☐☐

0=No, 1=Yes

Water samples

77. Are water samples from the household collected? .... ☐☐

0=No, 1=Yes

Animal milk samples

78. Are animal milk samples from the household collected? ... ☐☐

0=No, 1=Yes

If YES,

79. How many milk samples are taken from the household? .. ☐☐

18.1 Where is the origin of the milk sample 1? .... ☐☐

1=The camp, 2=The liberated area, 3= Other

18.2 Where is the origin of the milk sample 2? .... ☐☐

1=The camp, 2=The liberated area, 3= Other

Questionnaires

80. Is Questionnaire 1 – Background information, filled out? .. ☐☐

0=No, 1=Yes

81. Is Questionnaire 2 – 24 hour and 7 days recall, filled out? . ☐☐

0=No, 1=Yes

82. Is Questionnaire 3 – Breastfeeding practices, filled out? ... ☐☐

0=No, 1=Yes

Attachment 6

Ministrio de Salud Publica

República Árabe Saharaui Democrática

Consent form to participate in the iodine survey among Saharawi refugees.

We are conducting research on why the Saharawi population has a problem with goitre. This survey is a part of the Ministry of Health's work for examine and reducing this problem. If you decide to participate you and your child will be asked to contribute with:

- a sample of urine
- let us measure the throat with a special instrument looking for goitre
- measure your height and weight
- ask you questions about your food intake
- ask you questions about your background
- ask you about your family's food security situation, water sources, movements and income
- small samples of some of the food items and water, if necessary.

You and your family are randomly selected. We are asking children (boys and girls) from 0 to 12 years and females from 15 – 45 years to participate in the survey. You will be anonymous in the way that no names will be on the form where your answers are filled in. An id number will be made up just for this survey. On a separated list the doctors will keep your name and the id number, in case we find something in the tests that need treatment.

If you and your children take part in this project you help the Ministry of Health to show the world that there is a goitre problem. You also contribute to get necessary help to solve the problem for the Saharawi people. Taking part in this project is entirely up to you, and no one will hold it against you or your children if you decide not to participate. If you take part, you may stop at any time without punishment. In addition, you may ask to have your data withdrawn from the study after the research has been conducted.

The survey is a collaboration between the Saharawi Ministry of Health, Norwegian Church Aid, Akershus University College and several UN organisations. The contact person for the survey is Dr. Jahl Larad, Ministry of Health and Nutritionist Ingrid Barikmo, Norwegian Church Aid.

----------***----------***----------

I agree to take part and also let my child/children take part in this project. I know what we have to do and that we can stop at any time.

_____ _____

Signature Date

Akershus University College

NORWEGIAN CHURCH AID