The measurement of breast-feeding indicators in the Maltese Population

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K A R E N B O R G

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T U T O R : D R N E V I L L E C A L L E J A
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Title of Dissertation

The Measurement of Breastfeeding Indicators in the Maltese Population

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22nd August 2017

Signature of Student Date

11.06.2015
To

My parents
Who have shaped me into the person I am today,

My husband Joseph
For his unconditional love and support, and

Our children Jacques and Matthew
Who made the journey worthwhile.
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Abstract

Aim: The aim of the study was to measure the prevalence of breastfeeding in the Maltese population. Methodology: The study made use of mixed telephone survey and online methodology to obtain responses from 385 mothers on their breastfeeding practices. Apart from demographic data, information on breastfeeding was collected using The Infant and Young Child Feeding modules suggested by WHO. Results: A response rate of 99% was obtained. Maltese mothers start off their breastfeeding journey with a rate of breastfeeding initiation within the first hour of birth of 64.4%, which then dwindled to 9.6% of women exclusively breastfeeding at under 6 months of age, and 16.8% of women continuing to breastfeed at 12 months of age. Variables found to be statistically significantly associated with breastfeeding initiation and duration included mode of delivery, marital status, paternal employment and maternal education. Maternal age, baby’s gender and maternal employment were not found to be associated. Logistic regression models applied confirmed that maternal education, particularly a tertiary level education was the strongest statistically significant variable associated with breastfeeding at all the three time points assessed. These findings resonate well with findings from studies abroad. Conclusions: Recommendations were drawn up for a long-term method to regularly capture breastfeeding values in order to monitor the National Breastfeeding Policy. This study provided insight into breastfeeding practices in Malta, and provided suggestions for targeted educational campaigns and support to those women necessitating it most.
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<td>AAFP</td>
<td>American Academy of Family Physicians</td>
</tr>
<tr>
<td>AAP</td>
<td>American Academy of Pediatrics</td>
</tr>
<tr>
<td>AED</td>
<td>Academy for Educational Development</td>
</tr>
<tr>
<td>BFHI</td>
<td>Baby Friendly Hospital Initiative</td>
</tr>
<tr>
<td>CPAS</td>
<td>Clinical Patient Administration System</td>
</tr>
<tr>
<td>CBF</td>
<td>Breastfeeding with complimentary foods</td>
</tr>
<tr>
<td>CDC</td>
<td>Centers for Disease Control and Prevention</td>
</tr>
<tr>
<td>DHIR</td>
<td>Directorate for Health Information and Research</td>
</tr>
<tr>
<td>DHS</td>
<td>Demographic and Health Surveys</td>
</tr>
<tr>
<td>EBF</td>
<td>Exclusive Breastfeeding</td>
</tr>
<tr>
<td>ECHI</td>
<td>European Core Health Indicator</td>
</tr>
<tr>
<td>EDEN</td>
<td>Étude des Determinants pré et postnataux précoces du développement et de la santé de l’Enfant</td>
</tr>
<tr>
<td>EUROSTAT</td>
<td>Statistical Office of the European Communities</td>
</tr>
<tr>
<td>FANTA</td>
<td>Food and Nutrition Technical Assistance</td>
</tr>
<tr>
<td>HIS</td>
<td>Health Interview Survey</td>
</tr>
<tr>
<td>HIV</td>
<td>Human Immunodeficiency Virus</td>
</tr>
<tr>
<td>HSV-1</td>
<td>Herpes simplex type 1</td>
</tr>
<tr>
<td>ILO</td>
<td>International Labour Organization</td>
</tr>
<tr>
<td>ISCO</td>
<td>International Standard Classification of Occupations</td>
</tr>
<tr>
<td>IYCF</td>
<td>Infant and Young Child Feeding</td>
</tr>
<tr>
<td>IYCGD</td>
<td>Infant and Young Child Global Database</td>
</tr>
</tbody>
</table>
MDH  Mater Dei Hospital
MMR1  Measles, Mumps, and Rubella
NBF  Non-Breastfeeding
NBSAP  National Breastfeeding Policy and Action Plan
NENAS  National Elderly Needs Assessment Survey
NHS  National Health Service
NOIS  National Obstetric Information System
NSO  National Statistics office
PBF  Predominant Breastfeeding
PSHE  Personal, Social and Health Education
RAMON  Reference and Management of Nomenclatures
RCPCH  The Royal College of Paediatrics and Child Health
SPSS  Statistical Package for the Social Science
T2DM  Type 2 Diabetes Mellitus
UNICEF  United Nations Children's Fund
WHO  World Health Organization
CHAPTER 1

INTRODUCTION
1 Introduction

Mothers are faced with countless decisions during the pregnancy, birth and in the days and months to follow. As a medical professional expecting our first child, I was sure that I would have one less decision to make. Breastfeeding was a certainty. In the days that followed however, I realized how difficult it really was, and with all my knowledge and determination, it somehow seemed like I was not prepared for the difficulties and the commitment required. The professional and ever so resourceful help I received made it possible to not only successfully breastfeed one child but also even the next. This was an empowering experience, and one that convinced me to dedicate my research to those women whose breastfeeding journey was not a simple one. Mothers may feel on their own, but are they really? How can concrete action be taken if the real prevalence of breastfeeding, once a young family steps out of the hospital door, is not known? How can tangible help be provided to those requiring it most if we have not identified who these women are?

1.1 Breastfeeding in Malta

A historical account of breastfeeding in Malta by Savona Ventura (2004) explains how breastfeeding was the norm for a large part of our Medieval and early modern period. In Roman times, breastfeeding was already acknowledged as being the best
method for infant feeding. In the early 1700s, Maltese women breastfed for a long time, and if, for some reason, this was not possible when milk supply was low, the assistance of wet nurses was sought. With the introduction of commercially available milk, and a country faced with hostilities of the Second World War, the scenario shifted, never to regain the previous high breastfeeding rates.

1.2 The benefits of breastfeeding

Breastfeeding is the gold standard of infant feeding. Multiple organizations recognize the importance of exclusive breastfeeding for the first six months of an infant's life; (Bernard, Cohen, & Kramer, (2016); American Academy of Pediatrics [AAP], (2012)). Breastfeeding should be continued, along with the addition of solid foods when the infant is six months of age, for at least 12 months or as long as mutually desired by both the mother and child (AAFP, 2008; AAP, 2012; (Bernard, Cohen, & Kramer, (2016) ). The 2015-2020 National Breast Feeding Policy and Action Plan (NBPAP) (2015) acknowledges these recommendations together with the multitude of benefits that breastfeeding carries to infants, mothers and society at large.

Breastfeeding protects children from asthma and common childhood infections such as acute otitis-media, gastro-enteritis and severe lower respiratory infections because of the presence of antimicrobial, anti-inflammatory and immunomodulatory agents in
human milk that contribute to optimal immune system function (Duncan et al., (1993); Sabirov et al., (2009), Tarrant et al., (2010); Bilenko et al., (2008)). More studies have also established benefits of breastfeeding in reducing neonatal and under-five mortality (Jones et al., 2003). Consequently, a series of policy initiatives, guidelines and legislations have been implemented over a number of years to promote and protect breastfeeding.

1.3 International efforts

In May 1981, the World Health Assembly adopted the International Code on Marketing of Breastmilk Substitutes following the view that some infant food industries were undermining breastfeeding through aggressive and unethical marketing strategies (WHO, 1981). Malta already has legislation in place which regulates the marketing of breastmilk substitutes – The Infant Formulae and Follow-on Formulae Regulations (SL 449.52) 75 which transpose the provisions of the European Directive 2006/14/EC in this regard. In 1989, World Health Organization (WHO) and the United Nations Children’s Fund (UNICEF) recommended the Ten Steps to successful breastfeeding for facilities providing maternity services. One of the recommendations, step 4, was to initiate breastfeeding within at most one hour after birth. Other recommendations include having a written breastfeeding policy (step 1), training of health workers (step 2) and informing pregnant women about the benefits and management of breastfeeding (step 3). In July 1990, a global initiative called the “Innocenti Declaration on Protection,
Promotion and Support of Breastfeeding” was approved in an international meeting held in the Innocenti centre, Florence, Italy (WHO, 1990). In 1991, WHO and UNICEF launched the Baby Friendly Hospital Initiative (BFHI) following the Innocenti Declaration and this initiative, revised in 2009 (UNICEF and WHO, 2009), represented a global effort to implement practices that protect, promote and support breastfeeding. In 2003, WHO and UNICEF jointly developed the Global Strategy on Infant and Young Child Feeding (IYCF) building upon previous initiatives to further strengthen the protection and promotion of breastfeeding.

1.4 The measurement of breastfeeding indicators

Inconsistencies in breastfeeding definitions make comparisons across studies difficult. Using common definitions would add to the value of breastfeeding research (Labbok and Starling, 2012). A set of breastfeeding indicators was formulated by WHO (1991) to enable the generation of accurate prevalence figures that would be comparable across different countries. Such indicators would facilitate the measurement of policies and initiatives' success of failures. The standard questions and indicators recommended for the assessment of infant feeding practices published in 1991 were revised in 2008 following changes to infant feeding recommendations, eight core and seven optional indicators are currently recommended for population-based measurement of infant and young child feeding practices. Core indicators include the indicators for early initiation, exclusive breastfeeding at under 6 months and continued
breastfeeding at one year. Optional indicators include children ever breastfed, continued breastfeeding at two years, age appropriate breastfeeding and predominant breastfeeding under 6 months of age (WHO, 2008).

1.5 Rationale of the study

Malta's first breastfeeding policy was published in 2000, and the most recent is that of 2015. The latest breastfeeding policy specifically acknowledges the need for the establishment of a method whereby the core indicators can be measured so as to monitor the Breastfeeding policy. The paucity of local studies on breastfeeding has served as an impetus for this study, with the hope of providing a baseline for future comparison of breastfeeding practices in Malta. Currently Malta routinely collects data about breastfeeding practices at time of discharge, where presently, the rate of exclusive breastfeeding at time of discharge from hospital is that of 55.3% (NOIS, 2016).

1.6 Aim

The aim of this study was to determine the prevalence of breastfeeding in Malta as defined by WHO and as required by the local Breastfeeding Policy.

1.7 Objectives

In order to address the above-mentioned aim; the following objectives were developed:
• The estimation of breastfeeding indicators for initiation of breastfeeding within 1 hour of birth, exclusive breastfeeding under 6 months of age, and continued breastfeeding at 1 year

• The assessment of various methodologies for a sustainable data collection on the above breastfeeding indicators, including:

  Telephone survey method

  Online survey method

  Face-to-face interview at immunization clinics

• Evaluation of socioeconomic and other factors associated with higher or lower breastfeeding rates

• Obtaining feedback in the form of an elite interview of a local consultant paediatrician to provide feedback on data collection methodology.

1.8 Expected implications contribution to knowledge

It was expected that this study contributes to knowledge on the rates of breastfeeding in Malta, whilst shedding light on those variables associated with breastfeeding practices. This shall be useful for policy makers to plan targeted intervention and improve breastfeeding support for those who require it most.
CHAPTER 2

LITERATURE REVIEW
2 Review of the literature

2.1 Identification and eligibility of relevant studies

The literature was reviewed by searching a number of databases including PubMed, EBSCO, Google Scholar and the Hydi tool of the University of Malta. Literature review included journal articles, dissertations, reports and extracts from books. Local dissertations as well as direct communications with various experts were also referred to. Keywords used included breastfeeding, indicators, measurement, tools, prevalence, epidemiology, determinants and inequalities. Where possible information sources dated from the year 2000 onwards were selected. However, articles which were older yet considered to be relevant to the study were included, as were any references which were quoted in retrieved articles and found to be suitable. All articles found on the MMJ were reviewed, regardless of the date of publication, in view of the paucity in local literature on the subject. Figure 2.1 shows a flowchart of the process conducted in order to narrow down and select literature for the review.
Figure 2.1 Flow diagram showing identification of studies for inclusion in the literature review.
2.2 Benefits of breastfeeding

2.2.1 Benefits to the child

As a rule, breastfeeding has always been considered by health professionals as the ideal feeding practice for infants. It is the first means of communication between mother and child. The World Health Organisation (WHO) began to recommend exclusive breastfeeding for babies in 1990, following the Innocenti Declaration, and has since continued to emphasize that the optimal duration of exclusive breastfeeding is that of 6 months of age (Kramer and Kakuma, 2001). Maternal milk is the ideal source for early infant feeding due to the effective blend of immune factors and a unique constitution of nutrients that evolve in parallel with the growth and developmental needs of the infant, providing benefits to both the baby (Victora et al., 2016), and the mother alike (Horta et al, 2013).

Additional benefits in terms of cost have also been reported (van Rossem et al., 2009; Ip et al. 2009). Exclusive breastfeeding provides instantaneous health benefits to the infant. It decreases the frequency of respiratory tract infections (Cesar et al., 1999), otitis media (Daly et al., 1999), diarrhoea (Kramer et al., 2003) as well as mortality due to these diseases (Arifeen et al., 2001), particularly during the first six months of life. In meta-analyses and reviews published by WHO to consolidate evidence on the longstanding, effects of breastfeeding (Horta et al., 2007) concludes that while modest,
there are statistically significant long-term advantages from breastfeeding. Lower blood pressure, reduced incidence of excess weight, lower cholesterol levels, higher performance in intelligence tests and a lower incidence of Type-2 Diabetes Mellitus (T2DM) were found in individuals who had been breastfed. The scale of these effects was compared to other public health interventions, and it was found that especially for obesity and cholesterol levels, breastfeeding was similar if not more successful than dietary education and physical activity in later life.

2.2.2 Benefits to the mother

Findings from systematic reviews and meta-analyses carried out by Victora et al. (2016) emphasize how important breastfeeding is, irrespective of where mother and child live and whether rich or poor; whilst re-affirming the protection that breastfeeding provides against childhood infections, and against ovarian and breast cancer and T2DM in nursing women.

The initiation of breastfeeding has some instantaneous and short-term effects on the mother by stimulating oxytocin release which in turn reduces the chance of postpartum haemorrhage through several pathways. This also delays the resumption of ovulation thereby decreasing the risks associated with having two pregnancies close to one another. In the longer term, breastfeeding has been shown to offer protection to the
mother from pre-menopausal ovarian and breast cancer, coronary heart disease and osteoporosis (Tryggvadottir, et al. 2001). Mothers who breastfeed also show an earlier return to their weight before pregnancy (Dewey et al., 1993).

Breastfeeding carries benefits to maternal psychological health. Women are known to express a sense of bonding with their newborn through breastfeeding (Dennis and McQueen, 2009). Breastfeeding has an effect on the mother's psychological health. Although research findings are not yet conclusive, some studies have observed that women who have breastfed and moreover those with longer duration of breastfeeding have a lower risk of postpartum depression. There seems to be a reciprocal relationship between the two variables, with postpartum depression affecting breastfeeding, and vice versa (Hamdan and Tamim, 2009).

2.2.3 Benefits to the community

Breastfeeding is beneficial to the families, employees and communities at large (United States Breastfeeding Committee, 2013). The benefits of breastfeeding for society, include that breastfeeding is ecofriendly and financially efficient because the infant feeds exclusively from the breast (McFadden and Toole, 2006). Ball (1999) has determined that formula-fed children tend to suffer more ailments and carry a larger financial burden to healthcare when compared to breast-fed infants. A proportion of
these costs are attributable to the increased risk of childhood obesity (Jarosz, 1993; Weimer, 2001). Weimer (2001) goes on to explain how the reduction in environmental cost occurs as a result of a decreased need for packaging, transportation and wasteful by-product production that occurs due to formula feeding manufacture and use.

In a calculation using the Lives Saved Tool (Walker et al. 2013), Victora et al. (2016) estimated the yearly prevention of 823 000 child deaths and 20 000 breast cancer deaths at a global level if breastfeeding was scaled up to more than 90% exclusive breastfeeding for infants under 6 months, in 75 high mortality, low and middle income countries.

2.3 Definitions of breastfeeding

2.3.1 Recommendations by WHO

While there are many definitions for breastfeeding, the WHO definition of breastfeeding shall be used in this study. WHO has defined breastfeeding as the normal method for providing infants with the nutrients they need for healthy growth and development (WHO, 2013). Table 2.1 shows the recommended criteria for infant feeding practices from WHO (2013).
<table>
<thead>
<tr>
<th>Category of infant Feeding*</th>
<th>Requires that the infant receive</th>
<th>Allows the infant to receive</th>
<th>Does not allow the infant to receive</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exclusive breastfeeding (EBF)</td>
<td>Breast milk, including expressed breast milk or from a wet nurse</td>
<td>Drops, syrups (vitamins, minerals, medicines)</td>
<td>Anything else</td>
</tr>
<tr>
<td>Predominant breastfeeding (PBF)</td>
<td>The above being the predominant source of nourishment</td>
<td>As above plus liquids (water, water-based drinks, fruit juice, ritual fluids)</td>
<td>Anything else (in particular, non-human milk, food-based fluids)</td>
</tr>
<tr>
<td>Breastfeeding with complementary foods (CBF)**</td>
<td>Breast milk and solid or semisolid foods or nonhuman milk</td>
<td>Any food or liquid including non-human milk</td>
<td>Breast milk, including expressed breast milk or from a wet nurse</td>
</tr>
<tr>
<td>Non-breastfeeding (NBF)</td>
<td>No breast milk</td>
<td>Any food or liquid including non-human milk</td>
<td>Breast milk, including expressed breast milk or from a wet nurse</td>
</tr>
</tbody>
</table>

* The sum of EBF+PBF is called full breastfeeding (FBF). The sum of EBF+PBF+CBF is called breastfeeding (BF). The sum of EBF+PBF+CBF+NBF in a given sample or population must equal 100% as these categories are mutually exclusive.

** Note: this definition does not distinguish infants and children who take, in addition to breast milk, formula only, non-human milk only, solid or semisolid foods only, or different combinations and proportions of the above; nor does it take into account the proportion of breast milk on overall 24-hour food intake.

Table 2.1 Definitions of breastfeeding as recommended by the WHO, Source: NBSAP (2015)

### 2.3.2 Ambiguity of terms

Much controversy exists over definitions used in breastfeeding research. Researchers need precise and reliable definitions for breastfeeding, with duration and exclusivity as key measures of breastfeeding patterns (Noel-Weiss et al., 2012). Ambiguity in measuring and even reporting exclusive breastfeeding duration is common (WHO, 2007; Greiner, 2014), and this is even acknowledged in the Maltese National Breastfeeding Strategy and Action Plan (NBSAP) (2015). A systematic review of breastfeeding-related articles was carried out by Labbok and Starling (2012) aiming
to explore whether the researchers provided any definitions of the word ‘breastfeeding’, whether any descriptors were included in the term, as well as any further definitions. Alarmingly, only about a quarter of the 114 articles included in the study included any definition, and 21 of the 114 articles provided a citation of the definition used. The lack of provision of definitions was recognized more than 20 years ago prior to the Innocenti Declaration (1990). Definitions developed thereafter have guided work of subsequent WHO committee meetings and updates and hence, as noted by the authors, the WHO definitions are increasingly utilized nowadays.

2.3.3 Practical implications

In an effort to address issues related to difficulties in measuring breastfeeding indicators, the WHO (2007) has published detailed guidelines and practical information regarding both the measurement as well as the calculations that have to be carried out to measure breastfeeding indicators. Making use of such published guidelines would enable homogeneity in interpretation of results and in implementation of care standards. The issue of ambiguity in definitions used in breastfeeding has implications for interpretation of published work, for comparability of prevalence rates and generalization of findings (Labbok and Starling, 2012). As electronic patient medical records are more frequently incorporated in patient care it is also essential to have comparable definitions and indicators for universal inclusion.
2.3.4 Breastfeeding indicators

Awareness of these methodological difficulties has led the WHO to issue indicators for assessing infant feeding practices as a means of evaluating the duration of exclusive breastfeeding. These require data to be collected for breastfeeding immediately after birth, at 6 months and 12 months of age (WHO, 2007). The ECHI (European Core Health Indicator) Project (2003) defines an indicator as a dataset for the regular monitoring of health status, trends and determinants throughout the community and, within such a system, it has been recommended to adopt indicators to measure the initiation, duration and quality of breastfeeding. ECHI identifies the rate of exclusive breastfeeding at 3 and 6 months of age as the best indicators of duration of breastfeeding.

2.4 Factors Influencing Breastfeeding

Thulier & Mercer, 2009 list and classify the numerous variables associated with breastfeeding duration. These are summarized in table 2.2.
<table>
<thead>
<tr>
<th>Demographic Variables</th>
<th>Biological Variables</th>
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Note: WIC = Special Supplemental Nutrition Program for Women, Infants, and Children.

Table 2.2 Variables associated with breastfeeding duration (Source: Thulier and Mercier, 2009)

2.4.1 Demographic variables

2.4.1.1 Maternal age

Detailed analysis of the National Immunisation Survey results by the Centers for Disease Control and Prevention (CDC) showed how an association between breastfeeding rates and socio-demographic characteristics for mothers including maternal age, maternal education level, and family income. It has been found that breastfeeding rates increased with increasing maternal age for all race-ethnicity groups. Older mothers were more likely to choose breastfeeding than young mothers (McDowell, Wang, & Kennedy-Stephenson, 2008)
2.4.1.2 Race

In a study by Jones et al. (2015) African American women were found to have the lowest rates of breastfeeding initiation, breastfeeding at 6 months and continued breastfeeding at 12 months, compared with women from other ethnic and racial groups in the United States.

2.4.1.3 Family income

Breastfeeding rates were higher among mothers who have high family incomes than for mothers who have low family income (McDowell, Wang, & Kennedy-Stephenson, 2010). A thought-provoking study on the link between breastfeeding and socioeconomic status in Australia used data from three national health surveys (Amir and Donath, 2008). Data from the 1995 National Health survey had demonstrated a considerable socioeconomic gradient both for rates of initiation as well as rates of breastfeeding at 6 months. At 6 months, 37.4% of infants from most disadvantaged socio-economic quintile were breastfed, compared with 52.7% in the least disadvantaged quintile. Little had changed in the initiation and duration rates of 2004-5, with the added observation that there seemed to be an increasing divide between the highest and lowest socio-economic groups. Possible explanations for this are offered and include less family support to breastfeed, less ability to seek help with breastfeeding problems, less flexibility with working arrangements, and also possible
concerns with breastfeeding in public (Amir and Donath, 2008; Mitra et al., 2004).

2.4.1.4 Educational level

Low level of maternal education has been linked with low breastfeeding rates (Bertini et al., 2003). Van Rossem et al. (2009) set out to investigate the effect of a woman’s educational level in starting and continuing breastfeeding. Maternal education was used as an indicator of socio-economic status in this study conducted in Rotterdam, the Netherlands. Compared with their less educated counterparts, more mothers with a higher educational level started breastfeeding and continued for the first 2 months after birth. Similar conclusions were drawn up from a cross-sectional study in Ireland (Leahy-Warren et al., 2013). Having a tertiary education was identified as being highly statistically significant associated with a higher breastfeeding rate.

The effect of culture should never be underestimated. A systematic review and meta-analysis examining the impact of maternal education on breastfeeding prevalence in China was conducted by Clark et al. (2017). Results showed a negative association between maternal education and breastfeeding prevalence within 12 months’ post-partum. Mothers with a higher attainment of education were less likely to breastfeed in the context of Chinese culture and employment environment, and hence this has implications for the intervention programs to specifically target such groups.
2.4.2 Biological variables

Biological variables that might influence breastfeeding duration outcomes include insufficient milk supply, parity, mode of delivery, infant health problems, maternal smoking, maternal obesity and the physical challenges of breastfeeding. (Thulier and Mercer, 2009).

2.4.2.1 Insufficient milk supply

In an integrative literature review, Wambach et al. (2005) found that perceived insufficient milk supply was the commonest reason for weaning. Tarrant et al. (2009) concluded found that almost one-sixth of mothers (17 %) discontinued breastfeeding due to their perception that they had an insufficient breast milk supply and the perception that the breast milk was not meeting their infant’s nutritional needs and satisfying the infant’s hunger. The local study by Attard Montalto et al. (2008) similarly established ‘incorrect advice’; a term that included being told that milk supply was insufficient, as the commonest reason for stopping breastfeeding. 148 of the 405 women who participated in this study admitted being instructed to discontinue breastfeeding due to insufficient or “poor quality” milk by health professionals.

2.4.2.2 Parity

A meaningful finding from a study by Sutherland et al. (2012) based in the US, relates to the pattern of breastfeeding across multiple pregnancies by multiparous
women. The number of multiparous women who did not initiate breastfeeding rose from 7% in the first birth to 12% at the second birth and 15% for the third. Public health implications of such a finding from this study involving 812 women and 1574 births are that breastfeeding rates among women with more than one child can be increased through targeted support and intervention for pregnant women especially those that have had unsuccessful breastfeeding experiences.

2.4.2.3 Obesity

A study on the influence of maternal obesity in women of reproductive age (Rasmussen, 2011) elucidated the influence of excess maternal adiposity as related to hormonal and metabolic abnormalities, resulting in a delay of milk secretion. This combined with physical difficulties to latch onto the breast predisposed to decreased initiation and duration of breastfeeding rates. Van Rossem et al. (2009) also specify how the fact that obese mothers have more co-morbidities, are being more likely to be depressed hence explaining possible mechanisms contributing to difficulties in breastfeeding.

2.4.2.4 Medical reasons for using substitutes

In a publication by WHO (2010) on acceptable medical reasons for use of breast-milk substitutes a list of medical conditions for both mothers and babies that affect breastfeeding is provided. This report suggests that women permanently avoid
breastfeeding if they have HIV, and temporarily avoid breastfeeding if they have: herpes simplex type 1 (HSV-1). Breastfeeding is to be temporarily avoided in cases of illnesses that prevent mothers from taking care of their babies such as sepsis; and maternal medications that could affect the infants' health.

2.4.3 Social variables

2.4.3.1 Social support

The role of social support of breastfeeding initiation and duration is well-known and evidenced in studies as reported in a meta-analysis by Britton et al. (2007) where 34 randomised or quasi-randomised controlled studies were systematically reviewed. It was found that all forms of lay and professional support increase the duration of breastfeeding up to the first 6 months’ post-partum.

2.4.3.2 Partner’s attitude

The attitude of the woman’s partner to breastfeeding is crucial to both the woman's attitude as well as her breastfeeding practices. In a longitudinal study of 108 expectant couples on the UK, Scott et al. (2006) reported that a woman’s infant feeding attitude positively correlated with her partner’s attitude. Findings from this study are mirrored in those by De Montigny and Lacharite (2004) and Wolfberg et al. (2004) whereby these reported that the support of the infant’s father as well as the
encouragement of society in general plays an important role in a woman's breastfeeding success. An Australian study by Scott et al. (2006) made use of data from two longitudinal studies on infant feeding, one conducted in 1992/1993 and the other in 2002/2003. In both studies analyzing attitudes and predictors of breastfeeding of 1143 women, those women who perceived their husband to prefer breastfeeding were significantly more likely to leave hospital still breastfeeding and to be exclusively breastfeeding, than women who perceived their husbands to prefer formula feeding.

2.4.3.3 Professional support

To improve breastfeeding rates, it is crucial to engage healthcare providers in the process of encouraging mothers to choose breastfeeding for their children. A published joint statement from WHO and UNICEF to improve breastfeeding rates recommended that all healthcare facilities encourage breastfeeding choice (World Health Organization & UNICEF, 2009). These include measures such as starting breastfeeding within an hour after delivery, practicing rooming in, not supplementing newborns with formula, and not using bottles before discharge. Initial breastfeeding within at least one hour after delivery reduces neonatal mortality by 22%, and it could prevent more than one million newborn deaths, attributed to infectious diseases primarily, every year all over the world (Jana, 2009).

A local study by Bezzina (2014) about mothers’ perceptions of antenatal breastfeeding
education revealed that, the most first-time mothers perceived antenatal breastfeeding education positively. In particular, mothers found antenatal classes to be a good source of information to help in preparation for breastfeeding. However, a need for postnatal breastfeeding support was also identified with particular recommendations being those of post-natal breastfeeding classes using a hands-on approach.

The Baby Friendly Hospital Initiative (BFHI) was developed by the WHO in conjunction with UNICEF in 1993 to ensure that all maternity centres offer breastfeeding support. A maternity facility can be designated 'baby-friendly' when it does not accept low-cost or free breast milk substitutes, feeding bottles, and has implemented the 10 individual steps to support successful breastfeeding. A study by Merten et al. (2005) carried out in Switzerland whereby mothers (n=3032) filled in a questionnaire regarding infant feeding, concluded that following the increase in baby-friendly hospital facilities, breastfeeding rates on a national level improved. Infants were more likely to be breastfed for longer, and the duration of breastfeeding was found to be statistically significant to the degree of compliance of the facility to the ten steps.

A large Finnish study by Erkkola et al. (2009), highlight the magnitude of impact of hospital practices. The cohort study on 5993 births exposed how as many as 80% of infants received supplementary milk on the maternity ward. They also point out how there had been no increase in Breast Feeding Health Indicator (BFHI) units in Finland,
and this might explain the discrepancy between recommended and actual feeding practices, and a median rate of exclusive breastfeeding which is 4 months shorter than the WHO recommendations (1.4 months vs 6 months).

A local dissertation carried out by Cassar (2013) on midwives’ views of the implementation of the BFHI in Malta suggested that the majority of midwives are knowledgeable and in favour of implementation of the initiative. The study conducted on a sample of 120 midwives also mentioned the key obstacle perceived being that of mothers not being receptive to changes. The main recommendation is to begin and strengthen awareness on the promotion of the Ten Steps to Successful Breastfeeding, amongst student midwives, by providing specific lectures and training in breastfeeding management so as to start practicing early on the wards, during the students’ practical placements.

2.4.3.4 Mothers returning to work after delivery

Although nearly all countries have maternity protection legislation, only 98 (53%) of 185 countries meet the International Labour Organization’s (ILO) 14-week minimal standard and only 42 (23%) meet or exceed the recommendation of 18 weeks’ leave (International Labour Office, 2014) large informal work sectors further compound these inadequacies. Consequently, hundreds of millions of working women have no or inadequate maternity protection (Rollins et al., 2016).
Mandal et al. (2010) have highlighted the differential effects of full-time and part-time work status on breastfeeding in their US-based study on nearly 2000 mothers. Findings from this study present the impact that work schedules have on breastfeeding whereby the expectation of working full time after childbirth decreased the rate of breastfeeding initiation. Compared to breastfeeding mothers who did not work, returning to work within 12 weeks, and working more than 34 hours per week, were associated with a significantly shorter breastfeeding duration. The reality however is that part-time work may not be an option to some mothers, and may be impossible in some jobs. The flexibility required by some breastfeeding, others should be considered as paramount considering that part-time work, and even a short period of reduced work hours have a positive impact on rates of breastfeeding (Mandal et al., 2010).

Similarly, in France, Bonet et al., (2013) determined time of return to work as a major predictor for stopping breastfeeding, the sooner they returned to work, the less they breast fed their infant. The association was even stronger for those exclusively breastfeeding. This study on 2002 women and 1898 live births formed part of the EDEN (Étude des Determinants pre et postnatals précocés du development et de le santé de l’ Enfant) Study as a prospective child-mother cohort study on the influence of determinants of children’s development and health.
Knowledge and attitudes (psychological factors) are important factors that influence breastfeeding prevalence in general (Chambers et al., 2007). A systematic review conducted by de Jager et al. (2012) focuses on psychosocial correlates of breastfeeding whereby psychological factors were found to be not only importantly implicated in exclusive breastfeeding duration, but they can also be changed through interventions and experiences.

2.4.4.1 Maternal intention to breastfeed

Prenatal maternal intention, interest in breastfeeding, and maternal confidence in breastfeeding have all been identified as psychological variables associated with breastfeeding duration in the literature (Thulier and Mercer, 2009). In a study to identify the psychosocial variables associated with breastfeeding duration, an Australian study Forster et al. (2006) found that prenatal maternal intention and interest in breastfeeding were the most important factor in influencing breastfeeding success. Scott et al. (2004) emulate such findings and furthermore conclude that maternal attitude was a stronger predictor of breastfeeding initiation than sociodemographic characteristics. Robert et al. (2012), similarly revealed the association between exclusive breastfeeding duration and prenatal decision to breastfeed. Data from 525 mothers through a regional immunization survey was analysed to demonstrate how the median duration of exclusive breastfeeding was 3.5
months in women who intended to breastfeed before pregnancy, compared to a median
duration of 2 months in other women.

2.4.4.2 Self-efficacy

Self-efficacy, defined as the individual's confidence of their perceived ability to
perform a specific behaviour (Bandura, 1977); was recognized as one of the factors that
develops in the early days following delivery, and early breastfeeding difficulties
negatively impact exclusive breastfeeding duration. Jager et al. (2012) admit that
interpretation of results of available literature is however particularly challenging due to
the various methodologies and definitions of exclusive breastfeeding, as well as due to
the small sample sizes used. A local study carried out by Spitori (2014) regarding Maltese
mothers' perceptions on breastfeeding in public revealed that most women regarded the
breastfeeding walk-in clinic was the main factor which encouraged mothers to breastfeed
in public places, however public's attitude was regarded as a discouraging factor by most
mothers.

2.5 Measuring breastfeeding indicators in practice

The inconsistencies in methodologies used to measure breastfeeding indicators
and prevalence rates makes it difficult to generalise findings and compare results
between countries. Furthermore, most European countries, including Malta; do not submit
data that is used to compile for example the UNICEF Infant and Young Child
Global Database.

2.5.1 Studies making use of demographic and health survey data

Regular national health surveys can serve as a useful source of information, as can be appreciated from a Nigerian study using the 2013 Nigerian Demographic and health survey (Berde and Yalcin, 2016). Cross-sectional data was analysed using WHO definitions. A major limitation of this approach is that only the initiation of breastfeeding indicator was measured. An earlier study by Hanif (2011) utilized two Pakistan Demographic and Health Surveys to estimate various indicators in the IYCF proposed by WHO. 95% confidence intervals were calculated for the indicator values. Pakistani Demographic Health Surveys are not regularly conducted and the ones utilized in this study were conducted approximately fifteen years apart.

2.5.1.1 Established methodologies

UNICEF assists countries in collecting and analyzing data in order to fill data gaps for monitoring the situation of children and women through its Multiple Indicator Cluster Surveys (MICS) initiative. These household surveys were started off in 1995 when they were conducted in more than 60 countries. They are currently being conducted every 3 years. Data are collected during face-to-face interviews in carefully selected nationally or sub nationally representative samples of households. The survey tool relating to breastfeeding is the MICS6 Tool-Questionnaire for children under five.
years of age. The module for breastfeeding in this tool is extracted from the WHO IYCF modules. UNICEF works closely with other programmes, such as the Demographic and Health Surveys (DHS) programme, to harmonize methodologies and indicators used in MICS. The Demographic and Health Survey conducted via individual household face-to-face interviews include women of reproductive age (15-49) and individual questionnaires include questions on family planning, fertility, marriage, reproductive health, child nutrition, child health, and HIV/AIDS status. Some countries have a need for special information on topics not routinely included in the model questionnaires. To accommodate this need, and to achieve some level of comparability across countries, optional questionnaire modules address various additional topics. The current DHS-7 questionnaires in the “Woman’s Questionnaire” contains information on breastfeeding in the module related to IYCF. Questions related to breastfeeding are extracted from the IYCF modules by WHO.

One other methodology that was considered was the WHO STEPS instrument for non-communicable disease surveillance. Detailed review of the question-by-question guide did not reveal any questions enquiring about breastfeeding. One of the earliest available data, regarding measured local breastfeeding practices are those collected in the first Health Interview Survey (HIS) conducted in 2002. In this survey, mothers were asked about whether they breastfed their first-born child, and last-born child. They were then asked about breastfeeding duration, and given the option to choose from less
than 6 weeks, between 6 weeks and 3 months, between 3 months and 6 months, or more than 6 months. Of those that provided information, 35.54% claimed that they breastfed, and of these 8.69% breastfed for less than 6 weeks, and 8.86% breastfed for more than 6 months. Information gathered for the last-born child showed a decreased percentage of those who breastfed to 24.39% with only 5.06% breastfeeding for more than 6 months, and 6.82% breastfeeding for less than 6 weeks. The HIS was carried out for the first time in 2002 and in subsequent surveys, no questions on breastfeeding were included. The way these questions were constructed makes it difficult to compare figures to those obtained in this study. Interestingly however it shows that having a second child results in a lower prevalence and shorter duration of breastfeeding.

2.5.2 Individual prevalence studies

Individual studies found in the literature occasionally make use of available data from Demographic surveys or health interview surveys to analyze breastfeeding prevalence, trends and any associated variables. When this is not the case, a common method utilized is that of following up mothers at intervals to enquire about their breastfeeding practices. This usually serves as a way of providing a rate of breastfeeding when information is not available elsewhere. Comparison of findings cannot be easily achieved as definitions; research tools and population representativeness varies. Table 2.3 below summarizes various international prevalence studies as identified in the literature.
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<th>Methodology</th>
<th>Sample size</th>
<th>Definitions used</th>
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<tr>
<td>Kohlhuber et al. (2008)</td>
<td>Germany</td>
<td>prospective cohort study, mail questionnaire sent 2, 4, 6, &amp; 9 months after birth</td>
<td>3822</td>
<td>classified as exclusive, partial or full. Explained in study.</td>
</tr>
<tr>
<td>Santini et al. (2008)</td>
<td>Italy</td>
<td>prospective observational study, data collected from face-to-face interviews and clinical records</td>
<td>757</td>
<td>WHO</td>
</tr>
<tr>
<td>Chalmers et al. (2009)</td>
<td>Canada</td>
<td>Computer assisted telephone interviews at 5-10 months</td>
<td>6421</td>
<td>not specified</td>
</tr>
<tr>
<td>Attard Montalto et al. (2010)</td>
<td>Malta</td>
<td>telephone survey at 0, 1, 4, 8, 14, 18, 22 and 26 weeks post-natally</td>
<td>405</td>
<td>WHO</td>
</tr>
<tr>
<td>Carletti et al. (2011)</td>
<td>Italy</td>
<td>cohort study, infants followed up for 36 months. Feeding diary used &amp; telephone interview method.</td>
<td>400</td>
<td>not specified</td>
</tr>
<tr>
<td>Hanif (2011)</td>
<td>Pakistan</td>
<td>Pakistan National &amp; Demographic Health Survey</td>
<td></td>
<td>WHO</td>
</tr>
<tr>
<td>Robert et al. (2014)</td>
<td>Belgium</td>
<td>two-stage cluster sampling; combination of WHO infant feeding module with vaccine-coverage survey</td>
<td>525</td>
<td>WHO</td>
</tr>
<tr>
<td>Berde and Yalcin (2016)</td>
<td>Nigeria</td>
<td>cross-sectional data from Nigerian Health Interview survey</td>
<td>11851</td>
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<td>Khanal et al. (2016)</td>
<td>Nepal</td>
<td>cohort study, infants followed up to 6 months</td>
<td>735</td>
<td>WHO</td>
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<td>Ogbo et al. (2017)</td>
<td>Australia</td>
<td>routinely collected perinatal data</td>
<td>17564</td>
<td>WHO</td>
</tr>
</tbody>
</table>

Table 2.3 Studies on the prevalence of breastfeeding
2.5.3 Feeding diary

Carletti et al. (2011) set out to assess the prevalence and duration of breastfeeding practices in the Northeast region of Italy. Four hundred infants were enrolled at birth and these were followed up for up to 36 months. Data on infant feeding was collected using a feeding diary at fixed intervals, as well as through focus groups to encourage continued participation in the study. This study does not use definitions specified by WHO, yet a remarkable drop from a 98% rate of initiation of breastfeeding to 6% by 6 months was still demonstrated clearly.

2.5.4 Telephone survey method

A study was conducted within a similar geographical region in Italy by Santini (2008) to describe breastfeeding in Northern Italy in 757 infants for up to 1 year of age as well as identify possible related factors. These women were followed up by questionnaire at discharge, and a telephone questionnaire was conducted at the 4th, 12th, 24th and 48th weeks post-partum. Median duration of breastfeeding was 6.5 months and overall duration of breastfeeding until the first year of life was 26.3%. Exclusive breastfeeding was low, at a rate of 9.5% by the 24th week.

A similar methodology was employed by Chalmers et al. (2009) in Canada whereby a 45 minute, computer-assisted telephone survey was conducted to gather information on 6421 women. Here once again exclusive breastfeeding rates fell short of the globally
recommended WHO standards. Both studies recommend the regular monitoring of breastfeeding rates in order to better plan and coordinated breastfeeding promotion and activities.

2.5.5 Mailed questionnaire

The aim of the study by Kohlhuber et al., (2008) was to assess breastfeeding prevalence, duration and behaviour in Bavaria, Germany as a basis for targeting breastfeeding promotion measures. The Bavarian Breastfeeding Study was a prospective cohort study of 3822 mothers, using a questionnaire that was mailed to participants. Initial breastfeeding rates were once again high (above 90%). After 4 months, 61% were still breastfeeding albeit not exclusively. A major limitation of this study which is even acknowledged by the researchers themselves, is that there was an over-representation of older mothers and mothers with a higher educational achievement, that could have produced a over-estimation of breastfeeding rates.

2.5.6 Studies making use of immunization surveys

An interesting method used by Robert et al. (2014) is that of combining questions regarding breastfeeding within the immunization survey conducted to analyse immunization uptake rates. This Belgian study introduced a breastfeeding module based on WHO definitions in the vaccination coverage survey.
The National Immunization Survey conducted by the CDC is an ongoing, random-digit-dialled survey in more than 50 states that includes households with children aged 19-35 months at the time that the interview is conducted. Although the survey primarily intended to estimate specific vaccination coverage rates, questions on breastfeeding initiation and duration were added to the survey tool in 1999. Because children are aged 19-35 months at the time of the interview, each cross-sectional survey includes children born in 3 different calendar years. Response rates for NIS years 2001-2006 were consistently above 64% (Chapman and Pérez-Escamilla, 2009). More recently response rates were 62.6% for the landline and 33.5% for the cell phone respondents (CDC, 2016).

Personal communication with Dr. Farrugia Sant'Angelo (Medical Coordinator of Primary Child Health and Immunization) has indicated that vaccination covered solely in the private sector is only within the range of 5-10%. This could present an opportunity for data collection on breastfeeding at the time of infants’ vaccination visit at the health centres given that vaccination uptake in Health Centres is high.

2.5.7 Tools for measuring prevalence

Several countries rely on their own sets of indicators with their individual definitions and methods for data collection. Certain countries rely on cohort studies to base their policies upon, Australia being a case in point. Results from the Longitudinal
Study of Australian Children (2004) have been used to formulate Australia’s breastfeeding policy, and the cohort study collects data on breastfeeding at 1 hour after birth, and the for exclusive or any breastfeeding at monthly intervals up to 2 years of age.

In Canada, the Canadian Community Health Survey is conducted every year with the aim of tracking changes in both breastfeeding initiation and exclusive breastfeeding for at least six months. Data on breastfeeding rates are lacking in France and Germany, and any information available is through studies available in the literature rather than routinely collected data.

The Infant Feeding Survey has been the main source of data on breastfeeding in the UK. This survey has been the centre of controversy recently as it has been conducted routinely every five years since 1975, and the next one is long overdue. The survey was last carried out in 2010. One can therefore easily appreciate the lack of comparability of breastfeeding rates generated, and the difficulties that might arise in trying to keep track on breastfeeding progress in the different countries.

The quest for finding the ‘perfect’ tool is highlighted in studies such as that by Noel-Weiss et al. (2014) whereby a new tool for describing the type, amount and mode of infant feeding was created, and tested for validity and reliability. The study conducted
in Ottawa created what was eventually named the ‘FedCat Tool’ and incorporated a scoring system to evaluate the infants’ breastfeeding patterns.

In an effort to address issues related to difficulties in measuring breastfeeding indicators, the WHO (2007) has published detailed guidelines and practical information regarding both the measurement as well as the calculations that have to be carried out to measure breastfeeding indicators. The harmonization of data within the same country over time, and between countries allows comparison of the effectiveness of public health and policy measures that influence breastfeeding.

2.6 The local scenario

The NBSAP (2015) aims at providing the best evidence-based initiatives to promote initiation and sustainment of exclusive breastfeeding, as well as achieving higher breastfeeding rates for the first six months of life and thereafter. The policy specifically suggests indicators to be used or monitoring of the policy. These are:

- The proportion of children put to the breast within an hour of birth
- Exclusive breastfeeding in children under 6 months of age
- Continued breastfeeding at 1 year
Commitment to improving breastfeeding prevalence locally is also reflected in several strategies. Exclusive breastfeeding for the first 6 months of life is advocated in Malta’s obesity strategy: A Healthy Weight for Life: A National Strategy for Malta, (2012). After six months, it is recommended for infants to be fed adequate and safe complementary foods while continuing breastfeeding for up to two years or beyond. Moreover, the Food and Nutrition Action Plan (2014), states the commitment to increase the number of mothers that exclusively breastfeed up to six months. Presently, the only available Maltese data on the subject is that collated by the National Obstetric Information System (NOIS) Report (2017) that presents the latest figures up to 2016. This however only provides information regarding infant feeding methods at discharge that is usually between 2 and 5 days after delivery. Such infant feeding habits might change soon after, and furthermore data collected do not include information specified by the Breastfeeding Policy and the WHO. According to NOIS, only 55.3% of mothers were exclusively breastfeeding at discharge in 2016 (NOIS, 2017).

The only other available local data is from a study published by Attard Montalto et al. (2010) mentioned earlier. This study, conducted between 2004 and 2005 followed mothers who had initially decided to breastfeed by conducting telephone interviews on a monthly basis until the child reached 6 months of age. The study concluded that although the breastfeeding rate at time of discharge from hospital was 60%, this decreased to 38% when babies were 6 months old.
Therefore, in light of the literature presented here, and as shall be discussed in the upcoming chapter, the tools included in the WHO's guidance document entitled 'Indicators for assessing IYCF practices' have been considered to be the most fit for purpose. The choice is especially suitable because the local breastfeeding policy indicates and specifies the particular WHO indicators that it intends to eventually measure in order to monitor the policy.
CHAPTER 3

MATERIALS AND METHODS
3 Materials and Methods

3.1 Introduction

This chapter describes the methods chosen to carry out the research, the research tool, details of the study population, the pilot study carried out, and the data collection and analysis procedures applied.

3.2 Research design

The research consisted of mixed methodology using a combination of telephone and online survey techniques, methods which will be useful in providing a comprehensive picture of measurement of breastfeeding indicators. De Rada and Del Amo (2014) have shown how the use of face-to-face interviews together with telephone surveys is recommended in order to combine the speed and economy of the telephone survey with the representativeness that can be obtained in the face-to-face interview. Similarly, De Leeuw (2005) advocated the mixed methodology approach, this time as applies to online methodology together with the telephone survey method. A combination of these approaches, especially when the participant is left free to decide which methods to choose, should be considered more and more often as a practical and plausible option for researchers.
An elite interview with a consultant paediatrician was used to corroborate the findings of the study and help the researcher come up with recommendations.

3.3 Population

The population of interest was that of mothers of 6 month and 12-month-old children, whose children were born in Malta, to Maltese citizens.

3.4 Sample size and Sampling procedure

Following the advice of a medical statistician, it was calculated that a response by 384 individuals in the telephone survey method would enable an accuracy of +/- 5% in calculating estimates. Considering that the birth rates averaged 451 births per month in 2015 (NOIS, 2015), and that the current response rates for surveys is in the order of around 75% (such as the National Elderly Needs Assessment Survey (NENAS) conducted by the Directorate for Health Information and Research [DHIR] in 2012) all births that occurred within the months corresponding with infants of 6 months and 12 months at commencement of data collection were recruited for the telephone survey and online method. The same number of mothers was to be recruited by face-to-face interviews during immunization visits. In the current vaccination schedule infants receive the Hep B1 vaccine at 12 months and the Hep B2 & MMR1 at 13 months of age. The first 400 such babies presenting were to be recruited sequentially from among those attending the Vaccination Clinic for this purpose when the researcher is present,
in order to emulate how such a system would work in practice.

3.5 The research instrument

The tool utilized in this study was developed by combining two modules using the WHO Guidance document entitled ‘Indicators for assessing IYCF practices’ (WHO, 2007) as this has been considered to be the most fit for purpose. It provides tools that are already validated for collecting and calculating the indicator values of initiation of breastfeeding, exclusive breastfeeding under 6 months and continued breastfeeding at 1 year, that are considered as core indicators of Breastfeeding.

3.5.1 Validity and reliability testing

Validity and reliability testing of tools is described in the guidance document and, consequently, these were approved by WHO in 2006 after a report was submitted to the Food and Nutrition Technical Assistance (FANTA) Project and the Academy for Educational Development (AED)(2006).

3.5.2 Instrument development

Since one of the objectives of the study was that of assessing the relationship of factors possibly influencing breastfeeding, questions on demographic information were included.
3.5.2.1 Demographic variables

Demographic variables included:

- information about the child such as sex, age in months and weight;
- information about the care-giver (terminology specified by WHO (2007), including age, residence locality, relationship status, level of education, employment status
- information about the care-giver's partner such as employment status and the type of occupation or profession

3.5.2.2 The initiation of breastfeeding module

Two modules were consulted in this study. The initiation of breastfeeding module; and The IYCF module. The document accompanying these modules offers question-by-question instructions for each module and guides the researcher as to which questions to use for which scientific question, together with the sequence to be used when adapting these into a single questionnaire so as to fit the needs of the study.

This initial part consists of 2 simple questions, the first being whether the child has even been breastfed. The second question asks about when the child was first put to the breast. For this question, it also does not matter whether or not the mother's milk
had started flowing at the time of first putting the child to the breast.

If the respondent reported that she put the infant to the breast immediately after birth, the value "000" was circled. Otherwise, time was reported in completed hours or days. This has implications for calculating the indicator of breastfeeding within the first hour after birth.

3.5.2.3 The Infant and Young Child Feeding module

The purpose of the (IYCF) module is to find out how and what the child is fed at under 6 months of age, and costs of 4 main parts.

Question 1 asks if the child has ever been breastfed. For this question, it did not matter how long the respondent breastfed the child, only whether or not she ever gave the child the breast.

The following questions helped find out if the child was given breast milk some other way, rather than being breastfed by the mother when alternate feeding methods are used to provide breast milk to the child (such as expressed milk, milk fed by a spoon or cup)
The third question specifically asks about individual food items that the child was given on the previous day and the number of times consumed.

The final question in this module is an open-ended question intended to gather information about any other food items consumed by the infants that were not included in the list.

For the section of infants that were older than a year, they were finally asked the same 2 questions related to breastfeeding from the IYCF module.

3.6 Instrument Translation

Malta is a bilingual country having two registered official languages. Data from the Census of Population and Housing carried out in 2011 showed that for 93.2% of the population aged 10 years and over could speak fluently in Maltese and English. It was therefore deemed necessary to translate the research tool to the Maltese language.

Guidelines for questionnaire adaptation stressed the importance that the meaning of each question remains the same as originally intended. Conceptual translation methodology (Robine and Jagger, 2003) was utilised, whereby it was ensured that each question was properly translated to actually capture intended concepts.
3.6.1 Face validity of the tool

In order to ascertain face validity of the translated research tool, this was submitted for review by two medical doctors, a qualified nurse, and also the study supervisor. There was general consensus that the questionnaire content of both linguistic versions appeared to satisfactorily measure what it set out to measure. The final questionnaire to be used in this study is included in Appendix A, in both English and Maltese.

3.7 Pilot study

The pilot study was carried out between November and December 2016. A pilot study is done in order to identify and address any possible problems that might arise at a stage when they can still be corrected (Martyn, 1998; Cormack, 2000; Wood & Ross-Kerr, 2006). The pilot study was carried out among 20 mothers who did not form part of the final sample. Fifteen of these were done via a telephone interview and five were carried out at the Immunization clinics as face to face interviews. One common difficulty encountered was that relating to the infant’s weight. Respondents needed clarification as to whether the question was asking their weight or that of the infant. Amendments were made to facilitate the respondents’ understanding of this question and wording was changed to specifically guide the required answer. The questionnaire was also timed and estimated to take between 7-10 minutes to complete in both the telephone and face-to-face method.
3.8 Ethical considerations

Prior to embarking on this study, a detailed research proposal (including design description, covering letter, consent form, permission letters, research tool in English and Maltese) was submitted to and approved by the University Research Ethics Committee (Appendix B). In addition, permission was obtained from the director of Obstetrics and Gynaecology (Appendix C) to release department data. Finally, permission was then obtained the data protection officer at Mater Dei Hospital (Appendix D) to obtain access to the Clinical Patient Administration System (CPAS) and acquire participants’ addresses and telephone numbers.

3.8.1 Voluntary Participation

Involvement in this study was completely voluntary, and potential participants were informed of their right to refuse to take part in the study. Participation would not entitle them to any remuneration. Information was provided in the form of an invitation letter which was available in both English and Maltese (Appendices E and F). For those participants interviewed at the immunization clinic, the nurse briefly explained that I would ask for their participation so that the researcher would not influence the participants in any way. No coercive or deceptive methods were used.
3.8.2 Informed Consent

Those participants interviewed at the immunization clinics were given time to read the information sheet and were offered the possibility to ask for further clarifications before signing the consent form which was available in both English and Maltese (Appendices G and H). They were reminded that even after signing the consent form, they were free to stop at any time.

3.8.3 Confidentiality and anonymity

Demographic details were collected in order to correlate these with the study's intended outcomes. The name and ID card number were completely erased once linking was done to make sure that individual data was not traceable. This was explained to participants on the information sheet, consent form and verbally.

3.8.4 Potential for harm

Prior to commencing this study, verbal permission was obtained from a consultant psychiatrist specializing in post-natal psychiatric care to refer patients if the need arises. Furthermore, midwives at the breastfeeding clinic willingly accepted me to refer any mothers with issues arising relating to breastfeeding and to clarify issues if these arise.
3.9 Data collection

Following permission by the Chairperson of the Department of Obstetrics and Gynaecology (Appendix I) to access obstetric data, a list of infants born in November 2015 and June 2016 was obtained from the NOIS database. Following this, permission was obtained by the Data protection officer at MDH to access CPAS to obtain their household address and contact phone number. (Appendix C). An invitation letter was sent to a total of 512 mothers, after those of a foreign nationality were excluded. The invitation letter (Appendix E and F) consisted of a description of the study whilst explaining that they were to expect a phone call to ask for their participation. Despatch of a personally addressed introductory letter in advance of a telephone call is listed as one of the techniques by which telephone response rates can be improved (O'Toole et al., 2008).

3.9.1 Internet Data Collection

Multiple studies particularly looking into the reliability and validity of Internet based data collection methods suggest that the results from Internet and paper-and-pencil instruments are essentially equivalent (Cronk & West, 2002; Vispoel, Boo, & Bleiler, 2001). The main advantages of Internet survey methods are the quicker access to a larger number and geographically different participants, reduced research costs, and enhanced data accuracy (Rhodes, Bowie, & Hergenrather, 2003).
An online version of the questionnaire was created and a shortened address was written as a link for participants to fill up the survey online. Participants were asked to provide a contact phone number so as to identify them from the contact list and avoid contacting them again. Local data published by the National Statistics Office (NSO) in 2015 establishes that 81.9% of households in Malta and Gozo had access to internet. Regular internet usage was determined to be 76.2% of the total population aged between 16 and 74 years of age. Furthermore, Internet usage stratified by age in the group of interests-women of childbearing age, was calculated to be 97.9% in those between 16 and 24 years of age; 95% in those between 25 and 34, and 89.6% for women between 35 and 44. This served as a rationale for including this option to complete the questionnaire.

3.9.2 Telephone interviews

Data collection took place between November 2016 and April 2017. Targeting of call times is one of the methods whereby telephone responses is maximized (O’Toole, 2008). Most respondents were women with young children, who themselves claimed they preferred to answer the phone call in the evening when the partner was usually at home to look after the child whilst the questionnaire was being conducted. Most phone calls were therefore limited to after 5pm up until 8pm in the evening. Multiple attempts (up to 5) were made for those that did not answer the phone with the first attempt.
3.9.3 Face to face interviews at Immunization Clinics

Data collection using this method was conducted between November 2016-January 2017. Three health centres of Gzira, Birkirkara and Mosta were chosen due to proximity to the researcher’s residence. The researcher attended the respective health centre depending on the day when immunizations were taking place, and interviews were conducted between 8.30 am until 11.30am if children that fit the inclusion criteria were scheduled to attend.

3.10 Data Analysis and Data Presentation

All the data was inputted manually and analyzed using Microsoft Office Excel for Mac version 15; and the Statistical Package for Social Sciences (SPSS) Version 23. Data and was outlined by computing frequency distributions of descriptive characteristics. Tables were used to present these findings. Bivariate statistical analysis was used to determine the association between breastfeeding initiation and duration with selected variables. Multivariate regression analysis was then use to further evaluate how these variables relate to breastfeeding at the different time-points.
3.11 Elite interview

An elite interview using open-ended questions was carried out with a consultant paediatrician with a special interest in breastfeeding. This was considered to be important in order to provide insight on the practicalities and barriers to data collection on breastfeeding especially by paediatricians in their everyday practice even in the private sector.

Verbal consent was obtained and it was stressed that participation was entirely voluntary. Anonymity and confidentiality were ensured and notes were taken during the interview to record what was being discussed. Themes were identified keeping in mind important aspects of the research aim and objectives, and also taking into consideration certain pertinent results that were elicited from the quantitative phase (Creswell and Plano Clark, 2011)

3.12 Conclusion

This chapter has given an overview of the methods used to conduct the research. It also described the study population, the pilot study and the processes used in order to collect and analyse the data. A wealth of data and the results of the analysis of this data are presented in the coming chapter.
CHAPTER 4

RESULTS
4 Results

The study was carried out using quantitative methodology in the form of a telephone survey and online questionnaire, as well as face-to-face interviews at immunization clinics. Following this, an elite interview was then carried out. Results from these methods are described in further detail in the respective sections below.

4.1 Recruitment and response rate

This section describes the results of the quantitative data collected by three means:

- A telephone questionnaire
- Online questionnaire
- Face to face interviews at immunization clinics

The following flow chart next page illustrates the participant recruitment for the telephone and online methodology.
653 births from NOIS database

Non-Maltese nationals excluded

527 births

double entries for multiple pregnancies excluded

Invitation letter sent to 512 parents

successful completion of 62 online questionnaires

4 had already answered questionnaire online

2 refused to participate

1 was abroad during study period

63 had an abnormal dialling tone

61 never answered the phone

323 successful telephone interviews

Figure 4.1. Flow chart showing recruitment and response rate
The overall response rate when adding up the online and telephone responses was that of 75.2% (N=385) out of a total of 512 eligible participants. This is the rate obtained if those who could not be contacted by phone were considered as non-respondents.

The plan at the beginning of data collection was that of sequential recruitment of 12-13-month-old infants during their immunisation clinic visit. The researcher managed to conduct the questionnaire on 29 participants between November 2016 and January 2017, after which, following a logged total waiting time of 42 hours, this method of data collection had to be abandoned for the following reasons:

- Time-constraints: rate of patient recruitment was extremely slow, approximately that of 1 or 2 every 3 hours. This was because not all infants booked for their appointments turned up, especially in the winter months when immunisations are postponed if the infant is unwell. For a number of weeks, appointments were rescheduled due to the free provision of the influenza vaccine by the immunisation clinic.

- Nurses working at the clinic were extremely busy and when discussing with them, it seemed out rightly obvious that the extra task of filling up the questionnaire as is would be too laborious and time-consuming.
Lastly, approaching parents after the child had just received their vaccine was not the best time to conduct the interview, since their son or daughter had just been crying inside the clinic. For this reason, it was considered unethical to ask for their participation.

4.2 Population characteristics

4.2.1 Demographics

Gender distribution of infants and mode of delivery are represented in Table 4.1.

<table>
<thead>
<tr>
<th>Baby's gender</th>
<th>N (%)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>182 (47.3)</td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>203 (52.7)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Type of delivery</th>
<th>N (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vaginal delivery</td>
<td>250 (64.9)</td>
</tr>
<tr>
<td>Caesarean section</td>
<td>110 (28.6)</td>
</tr>
<tr>
<td>Instrumental delivery</td>
<td>25 (6.5)</td>
</tr>
</tbody>
</table>

Table 4.1. Gender of infants and mode of delivery.
4.2.2 Maternal characteristics

The mean age of the mothers under study was of 31, the highest proportion being aged 33. The maternal age was further grouped into three different age categories as shown in Table 4.2. These being, aged 29 years or less, between the age of 30 to 34 and 35 years and older. The marital status of each respondent was recorded and grouped according to three different categories that included; single, married and separated. The research participants were also asked two questions regarding their education. The first asked about the highest level of education attained being Secondary, Post-Secondary or Tertiary education. Moreover, the mothers were also asked at what age they left school. Women with a tertiary level of education were the least prevalent with those having a post-secondary level of education being the most frequent. Table 4.2 summarises maternal characteristics.
Maternal age

<table>
<thead>
<tr>
<th>Age Group</th>
<th>N</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 29 yrs</td>
<td>130</td>
<td>33.8</td>
</tr>
<tr>
<td>30-34 yrs</td>
<td>157</td>
<td>40.8</td>
</tr>
<tr>
<td>&gt; 35 yrs</td>
<td>98</td>
<td>25.5</td>
</tr>
</tbody>
</table>

Marriage status

<table>
<thead>
<tr>
<th>Status</th>
<th>N</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single mother</td>
<td>90</td>
<td>23.4</td>
</tr>
<tr>
<td>Married couple</td>
<td>284</td>
<td>73.8</td>
</tr>
<tr>
<td>Separated</td>
<td>11</td>
<td>2.8</td>
</tr>
</tbody>
</table>

Mother's education

<table>
<thead>
<tr>
<th>Education Level</th>
<th>N</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Secondary School</td>
<td>149</td>
<td>38.7</td>
</tr>
<tr>
<td>Post-Secondary School</td>
<td>130</td>
<td>33.8</td>
</tr>
<tr>
<td>Tertiary</td>
<td>106</td>
<td>27.5</td>
</tr>
</tbody>
</table>

Table 4.2 Maternal characteristics.

4.2.3 Locality

The participants were asked in which city or town they presently lived in Malta, and for how long have they been living in their household. The recorded answers were then translated to the 6 established districts of Malta (Figure 4.2) that include; Southern Harbour District, Northern Harbour District, South Eastern District, Western District, Northern District and Gozo. Table 4.3 then shows a representation of the different participants’ home districts. The highest proportion (27.5%) hailed from the
Northern Harbour District that include large towns such as B'Kara, Qormi, Hamrun and Msida. Equal proportions (19%) were recorded for Southern Harbour District and Northern District.

Figure 4.2 Statistical Districts and Regions of Malta
Residence District | N (%)  
--- | ---  
Southern Harbour District | 73 (18.9)  
Northern Harbour District | 106 (27.5)  
South Eastern District | 63 (16.4)  
Western District | 65 (16.9)  
Northern District | 73 (19)  
Gozo | 5 (1.3)  

Table 4.3 Mother participation by district codes of Malta

4.2.4 Mother and Partner Employment Status

The employment status and professions for all mothers were documented according to the International Standard Classification of Occupations (ISCO) – 08. A large proportion (32.2%) of the mothers have responded that they were not employed at the time of answering the questionnaire. The second group category with a high response (23.4%) were those that belonged to the professionals’ category (ISCO-08 category group 2). The same question about employment status and the type of profession was also asked to gather information on the mothers' partners (or husbands) according to ISCO-08. Three additional categories were encountered that included Skilled Agricultural, Forestry and Fishery Workers, Crafts and Related Trade Workers and Armed Forces occupations. The highest proportions were those who either were
single, and could not provide information on their partner (18.4%), followed by professionals (16.4%) and those who worked as self-employed (14.8%). The data can be seen summarized in Table 4.4 below.

<table>
<thead>
<tr>
<th>Occupation (ISCO-08)</th>
<th>Mother N (%)</th>
<th>Husband/Partner N (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>No Employment/No Information Given</td>
<td>124 (32.2)</td>
<td>71 (18.4)</td>
</tr>
<tr>
<td>Managerial Positions</td>
<td>20 (5.2)</td>
<td>37 (9.6)</td>
</tr>
<tr>
<td>Professionals</td>
<td>90 (23.4)</td>
<td>63 (16.4)</td>
</tr>
<tr>
<td>Technicians and Associated Professionals</td>
<td>33 (8.6)</td>
<td>31 (8.1)</td>
</tr>
<tr>
<td>Clerical Support Workers</td>
<td>52 (13.5)</td>
<td>10 (2.6)</td>
</tr>
<tr>
<td>Service and Sales Workers</td>
<td>43 (11.2)</td>
<td>46 (11.9)</td>
</tr>
<tr>
<td>Skilled Agricultural, Forestry and Fishery Workers</td>
<td>0 (0)</td>
<td>1 (0.3)</td>
</tr>
<tr>
<td>Crafts and Related Trades Workers</td>
<td>0 (0)</td>
<td>10 (2.6)</td>
</tr>
<tr>
<td>Plant and Machine Operators and Assemblers</td>
<td>6 (1.5)</td>
<td>27 (7.0)</td>
</tr>
<tr>
<td>Elementary Occupations</td>
<td>7 (1.8)</td>
<td>23 (6.0)</td>
</tr>
<tr>
<td>Armed Forces Occupations</td>
<td>0 (0)</td>
<td>9 (2.3)</td>
</tr>
<tr>
<td>Self-Employed</td>
<td>10 (2.6)</td>
<td>57 (14.8)</td>
</tr>
</tbody>
</table>

Table 4.4 Mother and partner employment status and profession type according to ISCO-08 in the study population
4.3 Feeding practices

4.3.1 Early initiation of breast feeding indicator

This indicator is defined as the proportion of children who were put to the breast within one hour of birth. Almost two thirds (64.4%) of the children were put to the breast within one hour after birth. Five per cent were put to the breast within the first six hours and a further 1.6% within the first day. Further explanation of timing of initiation of breastfeeding is explained in Table 4.5.

4.3.2 Exclusive breastfeeding under 6 months

This indicator is defined as the proportion of infants 0–5 months of age who are fed exclusively with breast milk. The proportion of the children that were exclusively breastfed at 5 months was that of 9.6%.

4.3.3 Continued breastfeeding at 1 year

This indicator is defined as the proportion of children of 12–15 months of age who are fed breast milk. Only 10.4% of those mothers with a 12-month-old child were still breastfeeding. Table 4.5 describes the results of breastfeeding practices as measured by the IYCF module by WHO.
<table>
<thead>
<tr>
<th>INDICATORS</th>
<th>% (N)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Initiation of breastfeeding</strong></td>
<td></td>
</tr>
<tr>
<td>within one hour of birth</td>
<td>64.4 (248)</td>
</tr>
<tr>
<td>within the first 6 hours</td>
<td>5.2 (20)</td>
</tr>
<tr>
<td>within the first day</td>
<td>1.6 (6)</td>
</tr>
<tr>
<td>within the second day</td>
<td>0.8 (3)</td>
</tr>
<tr>
<td>within the third day</td>
<td>0.8 (3)</td>
</tr>
<tr>
<td>more than 3 days</td>
<td>1.8 (7)</td>
</tr>
<tr>
<td><strong>Exclusive breastfeeding</strong></td>
<td></td>
</tr>
<tr>
<td>Under 6 months old</td>
<td>9.6 (37)</td>
</tr>
<tr>
<td><strong>Continued breastfeeding</strong></td>
<td></td>
</tr>
<tr>
<td>12 month old</td>
<td>16.8 (40)</td>
</tr>
</tbody>
</table>

Table 4.5 Breastfeeding by the WHO indicators

4.3.4 Additional feeding and breastfeeding practices at under 6 months

Table 4.6 describes additional feeding practices and their frequencies relevant to those children using infant formula. This particular section of the questionnaire was only relevant for those under 6 months of age. The infant formula milk frequencies were highest throughout the day, with the majority of the children (47%) being given
bottle “all the time” during the day (equivalent to between 6 and 10 times of bottle feeds per day. Thirty-two per cent were given a bottle between 1-5 times a day.

At the same time 21% were not given formula by the 5th month of age. Some of the children (29.6 %) were given water and other feeds that included broth (17.9 %) and cereals such as porridge (17.4 %) being the most common.

Almost 79% of children did not eat solid and liquidized food before the 5th month. Homemade puréed vegetables (10.1%) were the most popular to introduce weaning. Other solid and semi-solid foods given to infants included commercial puree food (6.2 %), rice cereal (0.3 %), liquidized fruit (2.9%), and pasta (1.8 %).
<table>
<thead>
<tr>
<th>Infant formula and feeding practices</th>
<th>% (N)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Infant formula frequency</strong></td>
<td></td>
</tr>
<tr>
<td>none</td>
<td>21.0 (81)</td>
</tr>
<tr>
<td>1-5 times</td>
<td>32.0 (123)</td>
</tr>
<tr>
<td>6-10 times</td>
<td>47.0 (181)</td>
</tr>
<tr>
<td><strong>Other foods and liquids given</strong></td>
<td></td>
</tr>
<tr>
<td>before/by 5 months</td>
<td></td>
</tr>
<tr>
<td>water</td>
<td>29.6 (114)</td>
</tr>
<tr>
<td>commercial puree food</td>
<td>6.2 (24)</td>
</tr>
<tr>
<td>rice cereal</td>
<td>0.3 (1)</td>
</tr>
<tr>
<td>homemade pureed vegetables</td>
<td>10.1 (39)</td>
</tr>
<tr>
<td>liquidized fruit</td>
<td>2.9 (11)</td>
</tr>
<tr>
<td>pasta</td>
<td>1.8 (7)</td>
</tr>
<tr>
<td><strong>no solid food given</strong></td>
<td>78.7 (303)</td>
</tr>
</tbody>
</table>

Table 4.6 Feeding practices among Maltese children (N=385)
4.4 Factors associated with breastfeeding

The relationship between breastfeeding and selected variables was explored at 1 hour after birth, at under 6 months and at 1 year of age.

4.4.1 Infant’s gender

A higher proportion of girls were breastfed when compared to boys for all indicators. This difference however was not found to be statistically significant.

<table>
<thead>
<tr>
<th>Baby’s Gender</th>
<th>Breastfeeding at 1 hour</th>
<th>Exclusive Breastfeeding at under 6 months</th>
<th>Breastfeeding at 12 months</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N (%)</td>
<td>N (%)</td>
<td>N (%)</td>
</tr>
<tr>
<td>Males</td>
<td>112 (61.5)</td>
<td>14 (7.7)</td>
<td>13 (12.5)</td>
</tr>
<tr>
<td>Females</td>
<td>137 (67.5)</td>
<td>23 (11.3)</td>
<td>27 (20.1)</td>
</tr>
<tr>
<td>p value</td>
<td>0.223</td>
<td>0.227</td>
<td>0.117</td>
</tr>
</tbody>
</table>

Table 4.7. Breastfeeding practices and baby’s gender
4.4.2 Maternal age

There were no differences in breastfeeding practices between the older and younger mothers in the study (maternal age) across the entire period of months 0 to 12 \((p > 0.05)\) (Table 4.8)

<table>
<thead>
<tr>
<th>Maternal Age</th>
<th>Breastfeeding at 1 hour N (%)</th>
<th>Exclusive Breastfeeding at under 6 months N (%)</th>
<th>Breastfeeding at 12 months N (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 29</td>
<td>87 (66.9)</td>
<td>12 (9.2)</td>
<td>10 (13.5)</td>
</tr>
<tr>
<td>30 - 34</td>
<td>102 (65.0)</td>
<td>20 (12.7)</td>
<td>16 (17.2)</td>
</tr>
<tr>
<td>&gt; 35</td>
<td>60 (61.2)</td>
<td>5 (5.1)</td>
<td>14 (19.7)</td>
</tr>
<tr>
<td>(p) value</td>
<td>0.669</td>
<td>0.13</td>
<td>0.62</td>
</tr>
</tbody>
</table>

Table 4.8 Breastfeeding and maternal age

4.4.3 Locality

There were no differences in breastfeeding practices between mothers living in various districts of Malta \((p > 0.05)\). However, both the mothers' employment status and the partner's employment status played a very significant part in breastfeeding initiation and continuation over the period of 5 to 12 months.
<table>
<thead>
<tr>
<th>Locality</th>
<th>Breastfeeding at 1 hour N (%)</th>
<th>Exclusive Breastfeeding at 5 months N (%)</th>
<th>Breastfeeding at 12 months N (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Southern Harbour District</td>
<td>44 (60.3)</td>
<td>5 (6.8)</td>
<td>5 (13.5)</td>
</tr>
<tr>
<td>Northern Harbour District</td>
<td>65 (61.3)</td>
<td>11 (10.4)</td>
<td>13 (18.3)</td>
</tr>
<tr>
<td>South Eastern District</td>
<td>39 (61.9)</td>
<td>4 (6.3)</td>
<td>2 (5.7)</td>
</tr>
<tr>
<td>Western District</td>
<td>44 (67.7)</td>
<td>10 (15.4)</td>
<td>9 (22.0)</td>
</tr>
<tr>
<td>Northern District</td>
<td>53 (72.6)</td>
<td>7 (9.6)</td>
<td>11 (22.0)</td>
</tr>
<tr>
<td>Gozo and Comino District</td>
<td>4 (80.0)</td>
<td>0 (0)</td>
<td>0 (0)</td>
</tr>
</tbody>
</table>

| p value                  | 0.53                          | 0.479                                    | 0.303                           |

Table 4.9 Breastfeeding practices by locality

4.4.4 Maternal Employment

ISCO-08 categories were further collapsed into categories as defined by EUROSTAT's Reference And Management Of Nomenclatures (RAMON, 2017). This is
shown in table 4.10. Mothers classified as Managers, professionals, technicians and associate professionals had the highest rates of breastfeeding throughout the study population. This was not found to be statistically significant nevertheless.

<table>
<thead>
<tr>
<th>ISCO-08</th>
<th>Whole population</th>
<th>385</th>
<th>238</th>
</tr>
</thead>
<tbody>
<tr>
<td>N° newborns</td>
<td>Breastfeeding at 1 hour</td>
<td>Exclusive Breastfeeding at 5 months</td>
<td>Breastfeeding at 12 months</td>
</tr>
<tr>
<td>N (%)</td>
<td>N (%)</td>
<td>N (%)</td>
<td>N (%)</td>
</tr>
<tr>
<td>NAP/NRP No Employment</td>
<td>76 (81.3)</td>
<td>9 (7.3)</td>
<td>7 (9.3)</td>
</tr>
<tr>
<td>OC1-3 Managers, professionals, technicians and associate professionals</td>
<td>102 (71.3)</td>
<td>17 (11.9)</td>
<td>22 (23.2)</td>
</tr>
<tr>
<td>OC4-5 Clerical support workers, service and sales workers</td>
<td>57 (60.0)</td>
<td>8 (8.4)</td>
<td>10 (17.5)</td>
</tr>
<tr>
<td>OC8-9 Plant and machine operators and assemblers, elementary occupations</td>
<td>7 (70.0)</td>
<td>0 (0)</td>
<td>0 (0)</td>
</tr>
<tr>
<td>OTH Self-Employed</td>
<td>7 (70.0)</td>
<td>3 (30.0)</td>
<td>1 (33.3)</td>
</tr>
<tr>
<td>ρ value</td>
<td>0.575</td>
<td>0.248</td>
<td>0.288</td>
</tr>
</tbody>
</table>

Table 4.10 Breastfeeding and maternal employment
4.4.5 Partner's employment

Husband or partner's employment was statistically significant throughout all three different time points, (0 to 12 months). Breastfeeding had the highest prevalence in the category for Managers, professionals, technicians and associate professionals.
<table>
<thead>
<tr>
<th>N² newborns</th>
<th>385</th>
<th>238</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Whole population</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Breastfeeding at 1 hour</td>
<td></td>
<td></td>
</tr>
<tr>
<td>N (%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Exclusive Breastfeeding at 5 months</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>N (%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Breastfeeding at 12 months</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>N (%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>NAP/NRP</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No Employment/No Information Given</td>
<td>37 (52.1)</td>
<td>5 (7.0)</td>
</tr>
<tr>
<td>OC1-3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Managers, professionals, technicians and associate professionals</td>
<td>97 (74)</td>
<td>13 (9.9)</td>
</tr>
<tr>
<td>OC4-5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Clerical support workers, service and sales workers</td>
<td>39 (69.6)</td>
<td>7 (12.5)</td>
</tr>
<tr>
<td>OC6-7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Skilled agricultural, forestry and fishery workers, craft and related trades workers</td>
<td>8 (72.7)</td>
<td>1 (9.0)</td>
</tr>
<tr>
<td>OC8-9</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Plant and machine operators and assemblers, elementary occupations</td>
<td>28 (56.0)</td>
<td>2 (4.0)</td>
</tr>
<tr>
<td>OC0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Armed Forces Occupations</td>
<td>5 (55.6)</td>
<td>2 (22.2)</td>
</tr>
<tr>
<td>OTH</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Self-Employed</td>
<td>35 (81.4)</td>
<td>7 (12.3)</td>
</tr>
<tr>
<td><strong>p value</strong></td>
<td>0.04</td>
<td>0.504</td>
</tr>
</tbody>
</table>

Table 4. 11 Paternal employment and breastfeeding
4.4.6 Marital status

Being married was associated with a higher rate of breastfeeding in all time-points, and this association was statistically significant at the 1 hour and 12-month period.

<table>
<thead>
<tr>
<th>Marital status</th>
<th>Whole population</th>
<th>385</th>
<th>238</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N° newborns</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Single Mother</td>
<td></td>
<td></td>
<td>45  (50)</td>
</tr>
<tr>
<td>Married</td>
<td>199 (70.1)</td>
<td>31 (10.9)</td>
<td>36 (20.6)</td>
</tr>
<tr>
<td>Separated</td>
<td>5 (45.5)</td>
<td>0 (0)</td>
<td>0 (0)</td>
</tr>
<tr>
<td>( p ) value</td>
<td>0.001</td>
<td>0.269</td>
<td>0.031</td>
</tr>
</tbody>
</table>

Table 4.12 Marriage status and breastfeeding
4.4.7 Mode of delivery

Women who gave birth normally, as opposed to via Caesarian section or instrumental delivery demonstrated a higher prevalence of breastfeeding. This relationship was statistically significant for the initiation of breastfeeding and for breastfeeding under 6 months of age, yet the statistical significance did not hold up to the 12-month age. (Table 4.13)

<table>
<thead>
<tr>
<th>Whole population</th>
<th>385</th>
<th>238</th>
</tr>
</thead>
<tbody>
<tr>
<td>N° newborns</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Mode of delivery</th>
<th>Breastfeeding at 1 hour</th>
<th>Exclusive Breastfeeding at under 6 months</th>
<th>Breastfeeding at 12 months</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N (%)</td>
<td>N (%)</td>
<td>N (%)</td>
</tr>
<tr>
<td>Vaginal delivery</td>
<td>171 (68.4)</td>
<td>30 (12.0)</td>
<td>27 (18.6)</td>
</tr>
<tr>
<td>Caesarean section</td>
<td>60 (54.5)</td>
<td>3 (2.7)</td>
<td>9 (12.3)</td>
</tr>
<tr>
<td>Instrumental delivery</td>
<td>18 (72.0)</td>
<td>4 (16.0)</td>
<td>4 (20.0)</td>
</tr>
<tr>
<td>( p ) value</td>
<td><strong>0.03</strong></td>
<td><strong>0.012</strong></td>
<td>0.464</td>
</tr>
</tbody>
</table>

Table 4.13 Breastfeeding as associated with mode of delivery
4.4.8 Level of education

More infants whose mothers had a post-secondary and tertiary level education were put to the breast within 1 hour after birth for feeding. This was statistically significant when compared to those mothers having a secondary level of education. (p < 0.001 for month 0, p = 0.002 for under 6 months; and p = 0.006 for month 12). (Figure 4.14)

<table>
<thead>
<tr>
<th>Education level</th>
<th>Whole population</th>
<th>385</th>
<th>238</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N° newborns</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Secondary School</td>
<td>385 (48.3)</td>
<td>7 (4.7)</td>
<td>7 (7.5)</td>
</tr>
<tr>
<td>Post Secondary</td>
<td>96 (73.8)</td>
<td>11 (8.5)</td>
<td>16 (20.3)</td>
</tr>
<tr>
<td>Tertiary</td>
<td>81 (76.4)</td>
<td>19 (17.9)</td>
<td>17 (25.8)</td>
</tr>
<tr>
<td>p value</td>
<td>&lt; 0.001</td>
<td>0.002</td>
<td>0.006</td>
</tr>
</tbody>
</table>

Table 4.14 Breastfeeding practices across mothers with different education backgrounds
4.5 Regression analysis

Multivariate logistic regression analysis was further performed in order to determine any association that breastfeeding may have with other selected variables. Variables included were those found to be statistically significantly associated with initiation of breastfeeding within 1 hour of birth, with breastfeeding at under 6 months of age, and with breastfeeding at 12 months of age.

Variables found to statistically significant for initiation of breastfeeding within the first hour of birth were:

- Marriage status (p=0.001)
- Partner’s occupation (p=0.04)
- Maternal education (p=0.001)
- Mode of delivery (p=0.03)

Logistic regression analysis was performed, and the model showed how tertiary education specifically, was the one most strongly associated with breastfeeding initiation within 1 hour of birth. This can be demonstrated in Table 4.15.
The process was repeated for variables found to be statistically significant for exclusive breastfeeding at under 6 months of age. These were:

- Mode of delivery (p=0.012),
- Maternal education (p=0.002).

Similar to the previous result obtained tertiary education emerging as the best performing group, with the additional finding that for the first time, those with a post-secondary level of education are statistically significantly different from those with a tertiary level of education. This means, that at the under 6 months’ age, this particular group seems to be struggling more when compared to their performance at other time-points.
Table 4. 16 Logistic regression analysis for exclusive breastfeeding at under 6 months of age.

Variables included in the logistic regression model to study the association between breastfeeding duration at 12 months of age included the following values that were statistically significant:

- Marriage status (p=0.031)
- Paternal occupation (p=0.008)
- Maternal education (p= 0.006)
As for the previous indicators, maternal education proved to be the variable that was strongest positively associated with continued breastfeeding at 12 months.

### 4.6 Elite interview

An elite interview was conducted with a consultant paediatrician where the aim, methodology and preliminary results of this study were discussed with a view of obtaining expert opinion and advice on the sustainability of such a method for data collection, and other practicalities.

The main outcomes were the following:

- There is a general consensus that a system should be in place to monitor and evaluate breastfeeding rates and trends in Malta.
• A system making use of phone calls would be too laborious and time-consuming.

• A method was recommended by which the vaccination card in infant's baby book would be reformulated to include a tick-box asking about breastfeeding practices. Vaccination cards are due to be redesigned shortly so as to include new vaccines offered. Three columns were suggested to be ideally incorporated in a way that these can be ticked at each vaccination visit starting at the age of 6 weeks. These would ideally be marked as B for Breastfeeding, F for formula feeding, and W for Weaning, intended to capture the timing in which foods are introduced. The advantage of such a system is that it would be quick to fill in whilst providing a clearer snapshot of feeding practices. It also carries the advantage of capturing information from both the public and private sector.

4.7 General qualitative feedback

There were no open-ended questions in the questionnaire, however throughout the conversation these particular issues seemed to arise.
4.7.1 Use of breastfeeding clinic

The majority of women that made use of the breast-feeding clinic had words of praise regarding the service that was provided and help received at the clinic. A number of women however mention that they felt pressured to breastfeed and felt unaccomplished and felt unsuccessful in their breastfeeding journey.

4.7.2 Return to work

Returning to work was a big transition for many of the mothers. They reported that having the opportunity to pump at work was a difficulty and that the work environment was not conducive to breastfeeding.

4.7.3 The need for on-going support and guidance

Women also voiced their wishes for a service that would be able to offer ongoing education and guidance on breastfeeding in addition to those offered by Parentcraft in the ante-natal period.
4.7.4 Post-natal depression

Finally, a number of women, at no more than 0.5% of the population, claimed that they had difficulties with post-natal depression, and had received professional help.

In summary, the mixed telephone/online survey method proved essential to contact all women who participated in this study. A face-to-face method at immunization clinic was not fit for purpose. An alternative method is suggested for long-term sustainability of data collection. Maltese mothers start off their breastfeeding journey with a rate of breastfeeding initiation within the first hour of birth of 64.4%, which then dwindles to 9.6% of women exclusively breastfeeding at under 6 months of age, and 16.8% of women continuing to breastfeed at 12 months of age.

Maternal education, particularly a tertiary level education was the strongest statistically significant variable associated with breastfeeding at all the three time points assessed. The results obtained provide an insight on breastfeeding practices in Malta, and factors that can influence such factors. Many of these findings resonate well with observations from international studies and shall be discussed in greater detail in the following chapter.
5 Discussion

5.1 Introduction

This chapter focuses on a discussion of the various results of this study, in light of existing literature. It also presents limitations of this study.

5.2 Different methodologies used & Response rates

5.2.1 Response rate

Different methodologies were utilized for data collection in this study. This enabled the comparison of responses, and provided insight to the sustainability of such methods. The response rate in this study (75.2%) compares well with those from recent larger scale local studies such as the NENAS carried out by the DHIR (2012) with a response rate of 76.8% for a telephone survey methodology. When one looks closely at similar surveys using telephone methodology, care must be taken when interpreting response rates. Bugeja (2011) had conducted a study on public knowledge, attitudes and behaviour towards colorectal cancer screening in Malta, whereby a similar method of obtaining a list of individuals and tracing their contact details was utilized. Out of an original list of 800 subjects 209 contacts were not found and eventually, following recruitment of individuals for testing the research tool and piloting of the
questionnaire, a response of 93.1% was achieved (430 out of 462 participants). The same can be said for another local study by Debono, Vincenti and Calleja (2012), where public perceptions of climate change were analysed. This study initially started off with a list of 800 individuals, and a response rate of 92.7% was calculated, when those who could not be traced or did not answer the phone were not considered to contribute as non-respondents.

This implies that in this study, the response rate would be calculated to be 99.2%, which compares extremely well to these studies. Even if one considers the response rate achieved in the NENAS (2012), where the response rate was 76.8% in an elderly population. Elderly are usually easier to reach in the sense that a larger proportion of them are house-bound when compared to the population in this study.

A strength that needs to be highlighted is the importance of having obtained access to CPAS in order to link and acquire patient details. Had this not been the case, the overall participation rate would have suffered greatly. This is relevant because whichever system will eventually be implemented for measurement of breastfeeding rates in the future would eventually be run by the National health system, and utilize such database. This was therefore a realistic piloting of how such system work. Furthermore, the decision to utilize mixed methods for data collection proved fundamental to ensure such a good response rate.
5.2.2 Telephone methodology

The possibility of obtaining the list with all the births that occurred for the population of interest ensures that sampling bias was eliminated, whilst making sure that the participants were as representative of the target population as possible. One main difficulty encountered was that telephone contact numbers for the dataset were not readily available. This issue is also reported by Calleja and Garthwaite (2016) in a report on the challenges encountered when the Health Interview Survey was conducted in Malta. A substantial number of person-hours were required in this study to search for the telephone contact details of respondents in hospital databases once permission to access this was obtained. This means that such a factor has to be taken into consideration if this survey had to be regularly repeated in order to monitor the local breastfeeding policy.

Although laborious and time-consuming, achieving such a good response meant that any rates obtained would provide a clear picture of breastfeeding indicators in Malta, as specified by the NBSAP (2015). Most respondents were mothers with young children who were very difficult to contact during the mornings, and this restricted the time allowed for phone calls to afternoons and evening only.
5.2.3 Online data collection

Leahy-Warren et al., (2014) have utilized the online survey methodology in their Irish study on breastfeeding, and this suggested a plausible way of introducing this method for data collection. In addition, these strata of the population is known to have an online presence (NSO, 2015). Sixteen per cent (N=62) of respondents chose this option for answering the questionnaire, therefore it proved useful to include this alternative method.

5.2.4 Data collection at Immunisation clinics

Unfortunately, the interviewing at immunization clinics had a poor yield for the person-time employed. Nonetheless, personal communication with Dr. Farrugia Sant’Angelo (Medical Coordinator of Primary Child Health and Immunization) has indicated that vaccination in the private sector is only within the range of 5-10%. The large uptake up of vaccinations at the National Health Service level prompted the choice of this method to capture a representative sample of the population of interest. Age distribution was not statistically significant in the women attending immunization clinics and those who responded in the telephone and online method. Hence mothers attending vaccination clinics could still present a potential for capturing data, albeit perhaps not using the methodology employed by researcher. This therefore implies that, if the method suggested during the elite interview with a local consultant
paediatrician had to be implemented, it would work better whilst also capturing the intended population. The time spent at the clinics enabled the identification of ways by which such a system for data collection could be amended and ameliorated.

5.2.5 The elite interview

Feedback from the elite interview opened up new possibilities for combining data collection for breastfeeding with immunization data collection. This system would be unique in that there is no documentation of any similar system in the literature. The CDC in the U.S. combine data collection on breastfeeding when conducting immunisation coverage surveys. Yet this is done over the phone. Acquiring information in the scheduled immunisations starting from 6 weeks in the national health scheme, using immunization cards would be beneficial to depict trends with increasing age. A key benefit of utilizing such a method is that collection of data from different time-points enables the contribution to indicators such as ECHI, that require reporting of rates at a different interval with respect to WHO. It is also not time-consuming, and therefore health professionals are more likely to be compliant in taking up this new system. Last but not least, there is a main advantage of also capturing infants receiving vaccines in the private sector. However as stated previously this is still a small percentage of the whole population.
5.3 The objectives of the study and study findings

The objectives of the study were mainly addressed by the questionnaire administered in different scenarios with the ultimate aim being that of obtaining values for three breastfeeding indicators.

Other data obtained in this study included the identification of variables that were associated with breastfeeding initiation and duration. Finally, recommendations for a sustainable method of data collection were suggested during an interview with a consultant paediatrician.

5.3.1 Comparison to international data

Comparison to other countries goes beyond comparison of figures. Other countries' breastfeeding indicator values reflect successes or failures of strategies, policies and their implementation. It mirrors culture, and the methods by which health care professionals and policy makers have managed to engage mothers and convince societies to adopt practices with infants’ best interest at heart.

WHO’s recommended indicator of measuring the rate of breastfeeding within 1 hour after birth intends to capture the adherence to its ‘Ten steps to successful
Breastfeeding being the foundation of the WHO/UNICEF Baby Friendly Hospital Initiative (BFHI). They summarize the maternity practices necessary to support breastfeeding. The UNICEF IYCF database compiles data from across different countries, and different sources in a way that these can be comparable. Malta does not contribute to this database as yet.

5.3.1.1 Breastfeeding initiation

The rate of initiation of breastfeeding within the first hour of birth from this study was found to be 64.7%. Unfortunately, very few countries provide data of this indicator to the IYCF database. Regular health surveys carried out within individual countries provide some insight on the percentage of immediate breastfeeding initiation albeit some of the indicators and methodologies utilized are not universal. Canada, Australia and Norway feature amongst the countries with the highest rates of breastfeeding initiation. Breastfeeding was initiated for 96% of children aged 0–2 years as reported in the Australian National Infant Feeding Survey (2010); and the Maternity Experiences Survey, a survey conducted on behalf of the Public Health Agency of Canada (2006) measured initiation of breastfeeding at 90.3%. The Norwegian Health Directorate, (2009) on the other hand asserts a near-universal breastfeeding universal rate, with only 1% of babies never receiving any breast milk.
Malta compares extremely well to Ireland whose rate of breastfeeding initiation of 68% is nearly identical to that obtained in this study (Health Service Executive 2008). England has a higher rate of initiation of breastfeeding, at 83% (NHS information Centre, 2011).

5.3.1.2 Exclusive breastfeeding under 6 months

As the WHO recommends exclusive breastfeeding for the first six months, this is the time-point at which data are most frequently collected and reported. However, this time-point is problematic with respect to both the associated definition (i.e. exclusive breastfeeding at six months compared to up to six months) and its usefulness (as this is around the recommended time to introduce solid food and is therefore unlikely to be a stable indicator (Greiner, 2014). This can also be observed from findings in this study, since the rate of exclusive breastfeeding as defined by WHO is extremely low at 9.6%. Had any breastfeeding been included, the rate would have risen to 37.9%.

The rates of exclusive or full breastfeeding at six months across many countries for whom this value is available in the IYCF database. The rate is particularly low in the UK (<1% in 2010), Finland (1% in 2011) and Norway (7% in 2003), considered a model for breastfeeding success, also has low rates of exclusive breastfeeding at six months. Rates from Italy (5% in 1999), Belgium (12% in 2012), Denmark (17% in 2012) and the Netherlands (18% in 2008) show a slight improvement and the Maltese rate (9.6%)
would fit with the lower range of these countries. Significant escalation can be observed for the U.S. with a rate of 22.2% EBF at under 6 months in 2013 and 29% for Spain in 2012. Leaps have been achieved by countries such as India and Bangladesh with EBF rates at under 6 months of 64.9% (2013) and 55.3% (2014) respectively.

The rate of "any" breastfeeding at six months may provide a more stable measure (Greiner, 2014). In this measure, Norway ranks considerably higher than the other countries with rates of 80 to 82%, which may well be a reflection of its early implementation of the across most hospitals as well as its family-friendly workplace measures and policies (Ellingsaeter, 2009). A group of countries have reported rates around 50% including Australia (60% reported by the 2010 Australian national infant feeding survey), Canada (53.9% in the Canadian maternity experiences survey, 2009), and in the USA 44.3% breastfed at 6 months (CDC, 2011). The UK does not capture data for breastfeeding at this age and Ireland have a very low rate 9% partially (therefore not exclusively) breastfeeding at 6 months (Health Service Executive 2008).

5.3.1.3 Continued breastfeeding at 1 year

Having compared values for breastfeeding indicators to those of other countries, it comes to no surprise that little or no information is available on the breastfeeding at 1 year indicator for the countries mentioned previously. The UK has a 1 year
breastfeeding rate of less than 0.5% from the 2010 UK Infant Feeding Survey. The Longitudinal Study of Australian Children (2004) presents the figure of 30% breastfeeding at 1 year. The value of 16.8% reported in this study is a first for our country, and falls somewhere in between these two values. The gold standard remains Norway with the Spedkost study (Norwegian Health Directorate 2009) quantifying continued breastfeeding at 46%. Data available for other countries are those obtained from MICS and DHS surveys, whose methodology is harmonized and consist mainly of third world countries.

5.3.2 Breastfeeding prevalence in Malta

Responses obtained in this study enabled the establishment of three important indicator values:

- breastfeeding within an hour of birth at
- exclusive breastfeeding under 6 months of age at
- continued breastfeeding at 1 year.

Of those that participated in the first local Health Interview Survey (HIS) (2002) 54% of mothers claimed that they breastfed, and of these 8.69% breastfed for less than 6 weeks, and 8.86% breastfed for more than 6 months. Values are difficult to compare and contrast due to issues with definitions and methodology.
(Attard Montalto et al., 2010) had conducted a local study with the aim of identifying those factors responsible for cessation of breastfeeding in Malta. The breastfeeding rates captured in this study were those of 38% breastfeeding at 6 months, yet this percentage reflected ‘any’ breastfeeding, and not exclusive breastfeeding as specified by the WHO indicator. The National Information System (NOIS) database publishes yearly reports in local infant and maternal health issues. Last published in 2017, exclusive breastfeeding rates prior to discharge for 2016 were calculated to be 55.3%.

Figure 5.1 Trends observed in breastfeeding rates at discharge (Source: NBSAP (2016)), collated from NOIS.
**Infant feeding methods at time of discharge**

<table>
<thead>
<tr>
<th></th>
<th>2016</th>
<th>2015</th>
</tr>
</thead>
<tbody>
<tr>
<td>Breast only</td>
<td>2519</td>
<td>2584</td>
</tr>
<tr>
<td>Bottle only</td>
<td>1255</td>
<td>1176</td>
</tr>
<tr>
<td>Mixed (Breast &amp; Bottle)</td>
<td>730</td>
<td>659</td>
</tr>
<tr>
<td>Other*</td>
<td>51</td>
<td>34</td>
</tr>
<tr>
<td>Unspecified</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

* 'Other' - include babies who are still at hospital after 28 days and those who die before discharge

Figure 5.2 Comparison of feeding methods at discharge between 2015 and 2016 (Source: NOIS Report 2016)

At first glance, there does not seem to be major differences in values except for a small rise to above 60% in 2005 and 2006. One can also notice a slight decrease in the number of exclusively breastfed infants at discharge when comparing figures from 2015 and 2016. This rate is once again difficult to compare with findings from this study for the principal reason that breastfeeding practices at discharge are usually those at 2 to 5 days following birth, a time when professional support from health care professionals was still available. Soon as mothers return home and challenges crop up, these figures are highly likely to change.
5.4 Variables not associated with breastfeeding

5.4.1 Maternal age

Maternal age has been found to have a significant association with breastfeeding rates in an analysis of the National health and nutrition examination surveys. It has been found that breastfeeding rates increased with increasing maternal age for all race-ethnicity groups. Older mothers are more likely to choose breastfeeding than young mothers (McDowell, Wang, & Kennedy-Stephenson, 2008). CDC (2010) corroborates these findings, yet the same cannot be said for what this study concluded. Maternal age was not statistically significant and hence associated with breastfeeding for any of the indicators. One plausible reason could be that frequencies of maternal age within the study were mainly focused within the 30-34 years age group (40.8%).

5.4.2 Maternal employment

Maternal employment was not found to be significantly associated with breastfeeding initiation in duration in this study. Maternal employment has been linked to a drop in breastfeeding rates for mothers choosing breastfeeding as their infant feeding option. He specifies how work schedules, as well as return to work earlier eventually result in a shorter duration of breastfeeding. Bonet et al. (2013) substantiate this finding and in fact claim that the sooner women returned to work, the less they
breastfed their infant. Women in this study were not asked about their maternity leave or parental leave decisions. It would be interesting to further investigate the association, if any between maternal education, parental employment and breastfeeding rates. One might speculate that women with a higher level of education may be paired with partners having an occupation with a higher income. This can imply that such women might financially afford to take longer time away from their employment, and this would facilitate a longer duration of breastfeeding.

5.5 Variables associated with breastfeeding

5.5.1 Marital status

Marital status, specifically being married as opposed to being single or separated, was statistically significant in breastfeeding initiation as well as breastfeeding at 12 months within this study. This association was superseded by other variables when regression analysis was performed however. This illustrates the crucial role of partner support in women’s breastfeeding practices. The study by Scott et al. (2006) nicely emphasizes this when the women’s perception of whether their husband preferred bottle-feeding or not, was enough to influence women in favour of breastfeeding initiation and exclusive breastfeeding. Relationship dynamics are changing within our society, and the appreciation of this led to the undertaking of a
study commissioned by the President’s Foundation for Well-being of Society entitled Sustaining Relationships: Couples and Singles in a Changing Society (2016). This report highlights manners by which the nature of relationships and family structure is changing, and therefore the influence of marital status on breastfeeding may need further evaluation in the near future.

5.5.2 Mode of delivery

Results from this study have shown that exclusive breastfeeding at less than 6 months was statistically significant in women who delivered normally. Much conflicting evidence exists however in the literature, as Thulier & Mercer, (2009) identified in their systematic review. Trends for the association between this variable and breastfeeding have changed over time, and differ by country. In logistic regression analysis, maternal education resulted as providing a stronger association to exclusive breastfeeding at less than 6 months.

5.5.3 Partner’s employment

Partner’s employment contributes to the family’s socio-economic status, and in this study, it was found to be associated with breastfeeding at the 1 hour and 12 month indicators. Rates followed a similar pattern for the under 6-month indicator, however probably were not strong enough to achieve statistical significance. McDowell, Wang,
Kennedy-Stephenson, (2010) analyzed data from the National Health and Nutrition Examination Surveys carried out in the US between 1999 and 2006. Breastfeeding rates were significantly lower amongst those of a lower income. Possible explanations for this are offered by Amir and Donath (2008) in a similar study using Australian National Health survey data. They suggest that less family support to breastfeed, less ability to seek help with breastfeeding problems, less flexibility with working arrangements. Mitra et al., (2004) had also identified how women in lower socio-economic classes can be vulnerable, and therefore should be specifically targeted to ensure that additional support is provided for any breastfeeding difficulties.

5.5.4 Maternal education

Maternal education can be singled out as the single-most important variable in influencing breastfeeding initiation, exclusive breastfeeding at under 6 months of age as well as continued breastfeeding at 1 year. Logistic regression analysis has confirmed this and further distinguishes tertiary education as the predominant category that is most significantly associated in the three different times where breastfeeding rate was measured. Of particular interest in this local study was the fact that women in the post-secondary level of education have always performed as well as those with a tertiary level of education, except for exclusive breastfeeding at under six months; where they are statistically different from women with a tertiary level of education in the regression model used. This said, the rate of any breastfeeding (meaning not
exclusive breastfeeding) locally is that of 37.9%. It is therefore the exclusivity of breastfeeding that is a contributing factor for the low rate observed. This has implications for future research and for targeted interventions within this particular group.

Studies evaluated by Thulier and Mercer (2009) in a systematic review on variables associated with breastfeeding duration conclude that, educated women breastfeed more often and for longer periods of time. Similar to this study’s findings, Bertini et al. (2003) concluded that maternal education was confirmed as the most significant variable in their scenario in Florence, Italy. Having a tertiary education was identified as being highly statistically significant in association with breastfeeding (Leahy-Warren et al., 2013), consistent with what was concluded in this study.

These have vast implications for public health intervention. There is a need for programs that support and encourage breast feeding, focusing particularly on mothers with a low level of education.
5.6 Additional unsolicited feedback obtained from mothers during the questionnaire

The questionnaire was timed to take between 5 to 7 minutes to complete. Yet the reality was that women were enthusiastic to share details of their successes and obstacles during breastfeeding. The researcher took note of these issues as they emerged and are discussed below.

5.6.1 Need for more support

A proportion of respondents in this study shared their experiences on breastfeeding even though there was no specific question in the questionnaire targeted at capturing qualitative data. The need and request for additional help and hands on advice with breastfeeding difficulties resonates well with findings from a local study carried out locally by Borg Xuereb (2009). Women themselves had recommended that they would have preferred to be better equipped with more knowledge beyond that conveyed in ante-natal classes.

The Royal College of Paediatrics and Child Health (RCPCH), (2017) has issued a series of recommendations aimed at reversing the low rate of breastfeeding in the UK. Very noteworthy in their proposals, the RCPCH is calling for schools to include breastfeeding as part of compulsory personal, social and health education (PSHE)
lessons, as taught at secondary schools to pupils from the age of 11. Implementation of these practices and assessing their effectiveness might take time, yet if successful, it would be worth considering their adoption to the local scenario. This makes more sense given that maternal education was the single most important variable associated with breastfeeding initiation and duration, confirmed by regression analysis.

5.6.2 Return to work

Spiteri & Xuereb, (2012) conducted a qualitative study on lived experiences of Maltese mothers on returning to work. Findings showed that while society encourages mothers to return to work after birth there as not enough support during this delicate transition. This study identified the need to improve local policy with regards to family-friendly measures and the importance of an increase in local maternity leave duration.

5.6.3 Post-natal depression

Whilst conducting the interview, as many as 0.5% of women, mentioned that they had received professional help for post-natal depression without being prompted. Insight into the prevalence of this problem is provided by a local study that had been conducted in 2006 by Felice et al., who found that of the 193 women who were not
depressed at the time of the prepartum assessments, 20 (10.36%) subsequently received a diagnosis of depression when assessed during the postpartum period. Such issues must be taken into consideration when planning maternity care.

5.7 The National Breastfeeding Policy and the study findings

5.7.1 Targets for breastfeeding rates

The first Maltese Breastfeeding Policy was published in the year 2000, and set the ambitious goal of increasing the breastfeeding rate at discharge up to 90%, whilst increasing the proportion of infants still breastfeeding at 4 months up to 80%. Little reference is made to WHO definitions breastfeeding, and in fact it is not specified whether any of these rates refer to exclusive breastfeeding or not. Furthermore, the policy specified that in order to monitor the breastfeeding policy, breastfeeding rates should be monitored at 15 day, 2 months, 8 months and 1 year.

The most recent version of the Breastfeeding Policy published in 2015, makes no reference to these values, nor is there any mention of target values to be reached by implementation of the policy. There is only a mention of finding a way to best establish methods by which rates can be measured and trends monitored. The policy specifies that the aim is to be in line with WHO recommendations. If this is the case then, one
must consider the most recent WHO targets for breastfeeding, which recommend efforts to increase the global rate of exclusive breastfeeding under 6 months to be that of 50% (currently measured at 38%). WHO encouraged commitment and contribution towards this target by first and foremost urging countries to report their breastfeeding rates, something that Malta does not currently have in place albeit it was even recommended in the Breastfeeding policy of 2000. The rate of breastfeeding initiation obtained from this study (64.7%) falls short of the targets set back then, and this is even worse if the rate of exclusive breastfeeding at the time of discharge is taken into consideration, a rate that currently measures (55.3%). Ultimately breastfeeding is intimately linked to the Sustainable Development Goals, and is acknowledged to be influential in goals relating to:

- ending poverty, promoting economic growth and reducing inequalities (Goals 1, 8 and 10);
- hunger, health and well-being (Goals 2 and 3);
- education and global learning targets (Goal 4)
- Sustainable consumption (Goal 12) (UNICEF, 2017).

Additionally, exclusive breastfeeding for the first 6 months of life is advocated in “A Healthy Weight for Life: A National Strategy for Malta” (2012) whereby breastfeeding is considered as a golden opportunity to provide all infants with the best nutrition possible from the very start. Previous to that, the Strategy for the Prevention and
Control of Noncommunicable Disease in Malta (2010) had called for the revision of the Breastfeeding Policy, whilst advocating for the importance of promotion and facilitation of breastfeeding.

5.7.2 Policy initiatives in view of study findings

The role of maternal education and the crucial role that this plays in breastfeeding initiation and duration has already been discussed as one of the most significant finding from this study. The fact that mothers with a post-secondary level of education seem to be particularly struggling within the under 6-month exclusive breastfeeding rate is another key finding. This is mostly since mother's needs are specifically reflected, and public health action should focus mainly on such targeted action. The NBSAP (2015) specifies how initiatives should help in to promote breastfeeding during different phases in the pregnancy, as well as in different scenarios, such as in the community and at the workplace. Unfortunately, however there is no mention of exactly how such initiatives are planned to be achieved or else examples of specific actions intended for this matter.

In view of findings from this study, the old Breastfeeding Policy (2000) happens to include extremely appropriate initiatives for education. These are in line with the previously mentioned recommendations by the RCPCH (2017), and lists interventions such as including breastfeeding education in primary and secondary schools within
what was called a “social and health education programme” with the objective of promoting from an early age the value of breastfeeding. It also states that breastfeeding education should not be aimed towards women, but towards the whole community.

Return to work has been identified as one of the most challenging times following childbirth, and this is especially so for breastfeeding women. The breastfeeding policy addresses these issues by proposing initiatives to facilitate breastfeeding at the workplace such as various incentives such as flexible hours, time-off, and facilities for breastfeeding or expressing and storing breast milk.

Findings from this study highlight the role of socio-economic status as being important in influencing breastfeeding patterns. The current Breastfeeding Policy acknowledges this, and stresses the need for further research so as to identify the specific inequalities experienced by these women when breastfeeding.

Women emphasized the need for professional support both within the hospital, yet even more so after discharge. An interesting idea mentioned within the Policy is that of mother-to-mother volunteers where the policy encourages the establishment of support services provided by trained peer counsellors and mother-to-mother support groups, particularly in lower socio-economic groups and marginalized communities, where women are less likely to breastfeed.
Certain groundwork is however already available for the provision of services such as those provided by the Parentcraft Services and Breast-feeding Walk in Clinic. Around 2800 mothers/couples (around 65% of pregnant mothers) make use of Parentcraft annually for education and support throughout pregnancy (NBSAP, 2015). Similarly, the Breastfeeding Walk-in Clinic provides ongoing support to breastfeeding mothers after they are discharged from hospital. All breastfed babies are given an appointment to ensure they return to their birth weight. Mothers are also encouraged to turn up even without an appointment in order to tackle any issues of concern. The Breastfeeding Policy (2015) also makes reference to the BFHI, yet, unfortunately, no local hospital has been officially certified as yet. BFHI are acknowledged as a standard for best practices, and in fact training, clinical practice, and hospital assessments are all said to be based on compliance to the BFHI. The framework is therefore already existing and there is specific emphasis towards commitment to incorporate the achievement of all the BFHI criteria into the standards for quality accreditation of maternity and paediatric health service providers if finances permit.

Following research from this study, it is ultimately hoped that a method for routine data collection for measurement and reporting of breastfeeding indicators will be adopted, and concrete, targeted plans for action be devised accordingly.
5.8 Limitations of the study

The study encountered a number of limitations including those arising from a telephone survey methodology. These were excluded from the survey mostly because these were untraceable by phone. This was mitigated by introducing mixed methodology and the online survey served to allow women to participate via this approach (De Rada and Del Amo, 2014; De Leeuw, 2015).

Respondents might have not recalled accurately information related to months previously. A recently published study by Amissah et al. (2017) found that maternal recall of breastfeeding duration was found to be valid for 6 years after childbirth with a small median overall bias of 1 week toward overestimation. Whilst every effort was made to avoid desirability bias whilst conducting the survey, participants were aware of the researcher’s professional background and may have tried to answer in a way to try and please the researcher. To overcome such a limitation the researcher made every effort to remain as objective as possible and avoided any form of judgment or bias that would have influenced data collection.

It would have been interesting to have recruited enough participants from immunization clinics to compare findings between the two methods. The identification
of those difficulties encountered for this method however proved crucial in identifying what can be done to further develop this method.

The conclusions that may be drawn from the study as well as recommendations for clinical practice, public health education and public health research are outlined in the following chapter.
CHAPTER 6

CONCLUSION
6 Conclusion

The aim of this study was that of measuring the prevalence of breastfeeding indicators in Malta. The findings of this study have also addressed the objectives that were outlined in the initial research stage.

This study used mixed telephone and online survey methodology to obtain a response rate of 99% amongst those who were contacted by phone and online. Utilization of such methods for routine collection are extremely resource intensive, and an alternative method making use of vaccination cards at immunization visits is suggested as proposed during an elite interview with a consultant paediatrician.

This study has provided rates for breastfeeding indicators in Malta. Breastfeeding initiation within 1 hour of birth is 64.7%, exclusive breastfeeding at less than 6 months of age, 9.6%, and breastfeeding up to 1 year of age is at 16.8%. Comparison with figures from other countries is challenging because of different methodologies and definitions used. Yet these rates need improvement and are far from targets for breastfeeding rates set in the Breastfeeding policy (2000).

In the meantime, inferential analysis has found variables to be associated with breastfeeding initiation and duration. Whereas maternal age, baby's gender and
maternal employment were not found to have any association with breastfeeding; husband/partner’s employment, marriage status, mode of delivery and maternal education were found to be statistically significantly associated with breastfeeding initiation and duration. Of major importance was the strong link between maternal education and breastfeeding confirmed by logistic regression models generated for breastfeeding within 1 hour after birth, for exclusive breastfeeding under 6 months, and continued breastfeeding at 12 months. Logistic regression models generated for the three indicators repeatedly confirm how women with a tertiary level of education are those that are managing best. Mothers with a post-secondary level of education are not significantly different from those with a tertiary level of education, except at the under 6 months’ time-point, where they seem to be having difficulties. This presents a brilliant opportunity to direct focused interventions to this target population to support and empower women at this time.

6.1 Recommendations

6.1.1 Recommendations for data collection

- Data collection of the breastfeeding within the first hour after birth can be collected by NOIS. The midwife caring for the mother soon after birth can capture such data in the partogram soon after birth.
• The recommended method of collecting data during immunization as emerged from the elite interview can be piloted to assess its ability to generate routine data. Such data would enable the measurement of core breastfeeding indicators at more frequent age intervals.

• A further recommendation is that of the maintenance of a breastfeeding register with data pertaining to individual live births to enable further analysis.

6.1.2 Recommendations for Public health education

• Targeted interventions can be better planned for women with a lower educational level to meet specific needs of this segment of the population.

• Health care professionals should seize every opportunity to educate and inform about breastfeeding advantages, to empower a decision in favour of breastfeeding.

• A whole-of-society approach should be fostered, with education starting primarily in school aged children at a young age.
6.1.3 Recommendations for policy initiatives

- Increasing the proportion of “Baby-Friendly” hospitals may increase breastfeeding initiation and duration rates. Efforts should be made to achieve this accreditation, and adhere to its required practices. This ensures that hospital policies are conducive to a positive breastfeeding experience.

- Increasing support to breastfeeding women within the workplace to facilitate breastfeeding, and minimize barriers to its continuation.

- Build upon existing services of breastfeeding support such as the Breast-feeding walk-in clinic and the midwife services in the community to meet women’s request for hands-on and practical help following discharge from hospital.

6.1.4 Recommendations for further research

- Further research is required to identify what difficulties are hindering women from breastfeeding, and what they consider to be helpful in facilitating this decision.
It would be interesting to investigate the effects of targeted intensive breastfeeding support of sub-groups of the population, and how these would influence breastfeeding rates in our local population.

There has been consensus over the importance of breastfeeding for both mother and child for years now. The benefits of breastfeeding are well known, yet hardly any country reaches even 50% of the recommended level of exclusive breastfeeding by 6 months. Protection of breastfeeding goes beyond the measure of breastfeeding rates, and the mere identification of who needs most help. It requires a sincere commitment by policymakers and society at large. It requires support and a positive attitude across all sectors of society. It requires a proactive stance to genuinely safeguard the interest of infants, mothers and society at large. Ultimately, I hope that this project can serve as a stepping stone for the improvement of breastfeeding rates in Malta but most of all, for breastfeeding to be a positive journey for mother and child alike.
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Department of Health Promotion and Disease Prevention, Public Health Regulation Division, Ministry for Health, the Elderly and Community Care. A Strategy for the Prevention and Control of Non-communicable Diseases in Malta, April 2010. A focus on Public Health Action.


Spiteri, C. (2014) Mothers’ perceptions of breastfeeding in public places. B.Sc midwifery. Faculty of Health Sciences, University of Malta.


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APPENDICES
Appendix A

Data

Intervista' bit-telefon  Vaccination Clinic'
Centru tas-sahha: ___________________________

**INFORMAZJONI FUQ IT-TARBJA**  (Waqt il-vista' din l-informazzjoni tista tittiehed mil-klinika)

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### INITIATION OF BREASTFEEDING MODULE

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### INFANT AND YOUNG CHILD FEEDING MODULE

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Telephone interview Vaccination Clinic
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**CHILD INFORMATION**  [Obtain from vaccination clinic during visit]

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<td>5. Mode of delivery</td>
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**CARE-GIVER INFORMATION**

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<td>18. Partner Occupation/Profession</td>
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### INITIATION OF BREASTFEEDING MODULE

1. Did you ever breastfeed (Name)?
   - **YES** ................................................................. 1
   - **NO** ................................................................. 2
   - **END MODULE**

2. How long after birth did you first put (NAME) to the breast?
   - **IMMEDIATELY** ........................................... 000
   - OR
   - **HOURS** ........................................ 1  1  1
   - OR
   - **DAYS** .................................. 2  1  1

### INFANT AND YOUNG CHILD FEEDING MODULE

(Ask for 5 month data when interviewing 12month olds)

At 5 months of age

1. Has (NAME) ever been breastfed?
   - **YES** ................................................................. 1
   - **NO** ................................................................. 2
   - **GO TO 2a**

2. Was (NAME) breastfed yesterday during the day or at night?
   - **YES** ................................................................. 1
   - **NO** ................................................................. 2

2a. Sometimes babies are fed breast milk in different ways, for example by spoon, cup or bottle. This can happen when the mother cannot always be with her baby.
   - Did (NAME) consume breast milk in any of these ways yesterday during the day or at night?
   - **YES** ................................................................. 1
   - **NO** ................................................................. 2

3. Next I would like to ask you about some liquids that (Name) may have had yesterday during the day or at night.

<table>
<thead>
<tr>
<th>Liquid</th>
<th>Yes</th>
<th>No</th>
<th>Don't know</th>
<th>Times</th>
</tr>
</thead>
<tbody>
<tr>
<td>A Plain Water</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>B Infant formula</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>C Milk, such as tinned milk, powdered or fresh animal milk</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>D Juice or Juice drinks</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>E Clear broth</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>F Yogurt</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>G Thin porridge</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>H Any other liquid</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4 Any foods the child ate yesterday</td>
<td></td>
<td></td>
<td></td>
<td>Times</td>
</tr>
</tbody>
</table>


<table>
<thead>
<tr>
<th>Question</th>
<th>YES</th>
<th>NO</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>At 12 months of age</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 Has (NAME) ever been breastfed?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 Was (NAME) breastfed yesterday during the day or at night?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2a Sometimes babies are fed breast milk in different ways,</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>for example by spoon, cup or bottle. This can happen when the mother</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>cannot always be with her baby. Did (NAME) consume breast milk in any</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>of these ways yesterday during the day or at night?</td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Appendix B

Dr. Karen Borg
170, Sunrise
Mons. Alfred Mifsud Street
Birkirkara BKR1137

Dear Dr. Karen Borg,

Please refer to your application submitted to the Research Ethics Committee in connection with your research entitled:

The measurement of Breastfeeding indicators in the Maltese population

The University Research Ethics Committee granted ethical approval for the above mentioned protocol.

Yours sincerely,

Dr. Mario Vassallo
Chairman
Research Ethics Committee
Appendix C

20th October 2016

Prof. Mark Brincat M.R.C.S., L.R.C.P., F.R.C.O.G., Ph.D. (Lond.), F.R.C.P.I.
Director of Obstetrics & Gynaecology Department MDH
Consultant Obstetrician & Gynaecologist

Permission to access delivery data of Mater Dei Hospital

I am currently reading for my Masters in Public Health at the Faculty of Medicine and Surgery. As part of the programme I shall be carrying out a research study entitled "The Measurement of Breastfeeding Indicators in the Maltese Population" under the supervision of Dr. Neville Calleja.

For this purpose I am asking your permission to be able to access delivery data of mothers that have given birth at MDH in order to select the sample population from this list. Data collected will be used solely for the fulfillment of this research study. Participation is on a voluntary basis and individual confidentiality shall be maintained throughout the study.

Yours sincerely,

Karen Borg.
Appendix D

From: Data Protection at MDH datapro.mdh@gov.mt
Subject: RE: Permission for data collection - Prof Brincat approval
Date: 21 October 2016 at 8:31 AM
To: Karen Borg Fenech Imbroll
Cc: Aquilina Grazia at MDH-Health graziaa.aquilina@gov.mt, Buhagiar Nadine at MDH-Health nadine.buhagiar@gov.mt

Dear Ms Borg Fenech Imbroll

Good Morning

On the basis of the documentation you submitted, from the MOH data protection point of view you have been cleared to proceed with your study provided that you obtain approval from MOH CEO and the University Ethics Committee. Please contact Ms. Nadine Buhagiar on 2545 5334 or Ms. Grazia Aquilina on 2545 5346 to present a copy of your approvals and fill in the appropriate Data Protection Form. Remember that in no way should you retain any personal details you obtain from your research and this should be destroyed at the end of your study.

All medical records are to be viewed at the Medical Records Department MOH.

You are requested to submit a copy of your findings to this office at the end of your study.

Regards

Sharon Young
Data Protection Officer

Mater Dei Hospital, Triq Il-Qroqq, Msida, Malta MSD 2090 | Tel +356 2545 0000 | www.mdh.gov.mt

Think before you print. This email and any files transmitted with it are confidential, may be legally privileged and intended solely for the use of the individual or entity to whom they are addressed.

From: Karen Borg Fenech Imbrroll [mailto:karen.borg@me.com]
Sent: 21 October 2016 08:27
To: Data Protection at MDH
Subject: Re: Permission for data collection - Prof Brincat approval

Good morning,

Please find attached Permission form Prof Brincat as requested.

Would appreciate if you let me know how to proceed especially with regard to permission to access cPAS. Thanks so much for your help and good day!

Regards,

Karen

On 19 Oct 2016, at 1:06 PM, Data Protection at MDH <datapro.mdh@gov.mt> wrote:

Dear Dr Borg

By procedure you have to wait for the approval first; then you present it to the person in charge of the section in question.

You will be cleared to proceed as soon as we receive Prof. Brincat's endorsement.

Regards

Simon Caruana
F/Sharon Young
Dear Karen,

No objection for you to proceed. Please follow existing protocols regulating these initiatives.

Regards,

Ivan Falzon
Chief Executive Officer | TealDH

Mater Dei Hospital, Triq tal-Qroqq, Msida, Malta MSD 2090 | Tel +356 2545 0000 | www.materdeihospital.org.mt

Think before you print.
This email and any files transmitted with it are confidential, be legally privileged and intended solely for the use of the individual or entity to whom they are addressed.

From: Karen Borg Fenech [mailto:karen.borg@me.com]
Sent: Friday, 21 October 2016 08:41
To: Falzon Ivan at MOH-Health
Subject: Permission for data collection M.Sc Public health

> Dear Dr. Falzon,
> > I am Dr. Karen Borg, currently a second year M.Sc Public health student and in the process of starting data collection for my dissertation under supervision of Dr. Neville Calleja. I am attaching a copy of my proposal which has already been approved by UREC. In the meantime Dr. Miriam Gatt who is consultant in charge of the National Obstetrics database and has already agreed to provide necessary data wished approval from the hospitals’ data controller since i shall be requesting the hospitals’ delivery data in order to contact mothers and conduct telephone questionnaires. In the meantime I have also obtained permission to access delivery data from Prof. Brincat as director of Johns & Gynae department. Would you kindly grant permission, and let me know should you require further information?
> > Thanks and regards,
> > Karen.
> > 79018782
> >
Appendix E

Invitation Letter

(English)

Dear participant,

I am a student from the Medical School, University of Malta, currently reading for my masters degree in Public Health. I am currently commencing my dissertation entitled “The measurement of breast-feeding indicators in the Maltese Population”. I would like to request your participation in an interview as this will be of significant contribution to the study. The interview is timed to last between 5 to 10 minutes, and will be conducted in either Maltese or English. The aim is to obtain information about breastfeeding rates in Malta, thus helping the health department in assessing breastfeeding trends and plan health promotional campaigns accordingly. You have been chosen to participate as you are considered eligible based on the criteria provided for our research. Please follow this link in order to complete the questionnaire.

http://tinyurl.com/breastfeedingmalta

The questionnaire is anonymous, ie I will not be recording your name or personal details at any point; and all published results will be aggregate, or representing groups. If you wish to ask any further questions or require more information, please don’t hesitate to contact me on 2144 5882 or 7901 8782. We appreciate your participation and we thank you in advance. Sincerely yours, Dr Karen Borg

Sincerely,

Dr Karen Borg  B.Sc(Hons)  Nursing MD
Il kwestjonarju huwa komplettament anonimu; kif ukoll nixtieq nassigurak illi d-dettalji tiehekg sejrin ji ġu proċessati bl-aktar mod sigur u professionali. Jekk inti tixtieq li tistaqsiihtiexi mistoqsijiet jew te ġ aktar informazzjoni, ġ jekk jog ġbok, ῥodxtoqglura milli tikkuntattjani fuq 2144 5882 jew 7901 8782. Sincermament naprezza il-partecipazzjonijhek, unirringlyazzjaktieg bill quddiem.

Dejjemhek, tieg

Dr Karen Borg B.Sc(Hons) Nursing MD
Appendix G

CONSENT FORM

I am a Maltese citizen and am over eighteen (18) years of age.

I have been asked to participate in a research study entitled:

“The measurement of breast-feeding indicators in the Maltese Population”

The purpose and details of the study have been explained to me by Dr. Karen Borg (384282M), and any difficulties which I raised have been adequately clarified.

I give my full consent to the Principal Investigator to make the appropriate observations and ask questions. I am aware of the inconveniences which this will cause.

I understand that the results of this study may be used for medical and scientific purposes and that the results achieved from this study in which I am participating may be reported or published: however, I shall not be personally identified in any way, either individually or collectively, without my written permission.

I am under no obligation to participate in this study and am doing so voluntarily.

I am not receiving any remuneration for participating in this study.

In case of queries during the study I may contact Dr. Karen Borg, telephone number 79018782

Signature of Principal Investigator

Signature of Participant

Date

Dr. Neville Calleja
Project Supervisor
Appendix H

PROPOSTA GHALL-FORMULA TAL-KUNSENS

Jien/a čittadin/a Maltija u għalaqt tmintax (18)-il sena.

Talbuni biex nieħu sehem fi studju ta ričerka bl-isem ta’:

“The measurement of breast-feeding indicators in the Maltese Population”

Il-ghan u d-dettalji ta’ l-istudju spjegathom li Dr. Karen Borg li wkoll iċċaratli xi mistoqsijiet li għamilt.

Nagħti il-kunsens tiegħi lill-persuna responsabbli għal din ir- ričerka biex jagħmlu l-osservazjonijiet u jistaqsu il-mistoqsijiet li hemm bżonn u nifhem li dan jista’ jkun ta’ skomdu għalija.

Jiena nifhem li r-rizultati ta’ dan l-istudju jistgħu jintużaw għal skopijiet xjentifiċi u jista’ jigi ppubblikat rapportion bil-miktub: jekk isir hekk b’ebda mod ma nista’ nkun idenfikat/a, individwalment jew bhala parti minn grupp, mingħajr il-kunsens tiegħi bil-miktub.

Jiena ma għandi l-ebda dmir li nieħu sehem f’dan l-istudju u dan qod nagħmli minn raija.

Jiena mhux qed niftallas biex nieħu sehem f’dan l-istudju.

Jekk ikolli xi diffikulta’ waqt l-istudju, nista’ nistaqsi għal Dr. Karen Borg, numru tat-telefon 79018782.

___________________________
Firma ta’ min hu responsabbli
tar-ričerka

___________________________
Firma tal-partecipant/a

Data

___________________________
Dr. Neville Calleja
Supervizur ta’ l-istudju
University Research Ethics Committee
University of Malta
Tal-Qroqq

To whom it may concern

Re proposed study:
The Measurement of Breastfeeding Indicators in the Maltese Population

The Directorate for Health Information and Research does have the identifiable data being requested for the above mentioned study. The Department will be in a position to provide the data for purposes of this study, which is being run under the supervision of Dr. Neville Calleja, when full Ethics approval has been granted by the University Research Ethics Committee.

Yours Sincerely,

Dr. Miriam Gatt
Consultant i/c National Obstetrics Information System,
Directorate for Health Information and Research.