HOW THE BACKGROUND CHARACTERISTICS INFLUENCES, DEMAND AND UNMET NEED OF CHILD SPACING AMONG WOMEN OF MALDIVES

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A project submitted in partial fulfillment of the requirements for the degree of Bachelors in Primary Health Care

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DECLARATION

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I hereby declare that this project is the result of my own work, except for quotations and summaries which have been duly acknowledged.

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ABSTRACT

Child spacing is a human right for all those who are in need. Therefore, child spacing methods should be supplied according to the demand of the certain community. Unmet need for child spacing is produced when the demands for child spacing services are not met in the community. The background characteristics that influences the demand and unmet need for child spacing includes, age; residence; region; education and wealth quintile of a women. This characteristic creates variation in the demand and unmet need for child spacing by increasing or decreasing the demand and unmet need for child spacing among women.

In order to support this fact, secondary dataset from Maldives Demographic Health Survey 2009 is been used to acknowledge how the background characteristics influences demand and unmet need for child spacing. Both inferential and descriptive statistics are used to analyze the result and local and foreign literature was reviewed to support the reasons behind the trends of the analyzed data.

It was known that, as age of women increases both demand and unmet need for child spacing decreases while the increase in education level of the women increases the demand and unmet need for child spacing in Maldives. As wealth quintile and residence show not much difference in the indicators, the south region of Maldives tends to have higher unmet need comparing to the rest of the Maldives, requiring for more studies to be done.

Key words

Unmet need for child spacing: women those who are fecund and sexually active but are not using any method of contraception, and report wanting to delay the next child.

Demographic Health Survey: Project is responsible for collecting and disseminating accurate, nationally representative data on health and population in developing countries

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GLOSSARY OF TERMS

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MDHS – Maldives Demographic Health Survey 2009

RHS- Reproductive Health Survey 2004

WHO- World Health Organization

DEFINITION OF TERMS

Family planning: the control of the number of children in a family and of the intervals between them, especially by the use of contraceptives

Child spacing: The lengths of intervals between births to women in the population. The time elapsed between marriage and first birth.

Limiting: To achieve such birth control, they can abstain from sexual intercourse (in particular after the birth of a child), protect themselves from the risk of a pregnancy by contraception or sterilization, or use abortion to terminate a pregnancy.

Demand: An insistent and peremptory request, made as if by right

Unmet need: The percent with an unmet need for family planning is the number of women with unmet need for family planning expressed as a percentage of women of reproductive age who are married or in a union. Women with unmet need are those who are fecund and sexually active but are not using any method of contraception, and report not wanting any more children or wanting to delay the birth of their next child.

CHAPTER 1

INTRODUCTION

Dispersion and enhancement of human population has always been one remarkable factor to investigate as it has always dug out interesting features about human species and history of mankind. For this reason, studying about the aspects of human population concerning human fertility and mortality has lead us to understand other underlying causes in these aspects of human population.

One of the very inquisitive incidents relating to human fertility has been seen after world war two in 1940; increasing in the number of childbirths in the countries that partook in the war. It was called the Baby Boom. This demographic phenomenon has lead demographers to think twice more about human population and the other underlying characteristics that are relating to control and adjust human population. (Matthias Doepke, 2007) This is considered as one of those incidents which lead to wide usage and availability of various birth control methods. A dramatic change in human population has been discovered soon after the introduction of various birth control methods. (London, 1982)

1.1 Background of the study

This study is based on understanding the demand of human fertility control methods and the factors that influences the needs of these fertility control methods. Fertility control method, or birth control method itself came with two major initiatives, including ways to limit births and spacing between children, which became known as family planning. Usually family planning is to be taken in part, before getting pregnant. That way, the parents can decide the desired number of children they ought to have for limiting births and the time to be taken in between each pregnancy for spacing between children.

One of the basic family planning initiatives, known as family planning for limiting births, can be achieved by various contraceptive methods including modern and traditional contraceptive methods. According to W.H.O factsheet the most effective birth control method for family planning for limiting purpose is included in modern contraceptive methods. (WHO, 2012)

The other basic initiative of family planning, called spacing between children, is usually meant as waiting between pregnancies. According to The partnership for maternal child health and new born care, the ideal gap between two pregnancies is more than 2 years. Child spacing has led to a noticeable amount of decrease in the pregnancy-related deaths. For this reason it has become a vital need to create awareness among the people of communities about child spacing and providing proper child spacing methods. (Shaw, 2012)

This study will be mainly based on the child spacing needs and the background characteristics relating to child spacing needs.

1.2 Problem statement

Family planning for child spacing is and has always been a basic human right. (Margaret greene, 2012) Therefore it is government's responsibility to provide the desired child spacing service to its people. For this reason, government or community should be aware of the required need of child spacing services for their community. Not being able to meet their need of child spacing can indeed lead to shortage of available resources and other consequences relating to over population. Addition to this, the health risks relating to not being able to gain control over the births involve many risks to women, infants and to the family as well.

Therefore it is vital to understand how much people are aware of the child spacing methods and what their demands are and to check whether their demands are met and who are with the unmet need for child spacing. This in turn will lead the community to be healthy in every aspect of its life.

1.3 Objectives of the study

Since the study will be mainly focused on the child spacing in Maldivian community, the main focus will be on meeting the following objectives:

- understanding the demand of child spacing in Maldives,
- understanding the unmet need of child spacing in Maldives and

- acknowledging the influence of the background characteristics such as age, residence, region, education and wealth quintile on both demand and unmet need for child spacing in Maldives.

To gain these objectives, a study was carried out to find answers to the noted research question.

1.4 Research question

As mentioned before, in order to minimize the risks due to not being able to meet the need of child spacing in the community, it is important to understand the factors or determinants that influence the need and demand of child spacing. Not being able to meet community's need for spacing between children is known as unmet need for child spacing.

Some highlighted background characteristics that influence this unmet need and demand for child spacing includes, age of the women; residence of the women; region where the women lives; educational status of women and the wealth quintile of the women.

And the question to be answered is how does the above mentioned background characteristics influence the demand and unmet need for child spacing in Maldives?

1.5 Significance of the study

The cultural norms and beliefs of each community are different from other communities. For this very reason, the lifestyles of the people living in each

community are unique. The way of child bearing, the certainty of dealing with child bearing and other living customs relating to fertility tends to differ in each community and each community tends to follow their own concept. The main motive of this is usually related not only to the socio-economic factors but also the demographic factors of the people living in that particular community.

As mentioned above, human fertility contains various characteristics that are important to study and to be conscious of. Understanding these factors helps to control fertility thus, controlling the risks related to it.

The main concept of this study is to understand these very characteristics that influence the demand for family planning for child spacing and to acknowledge how the same characteristics influences the unmet need for child spacing services.

In other words, the study is focused on how the determinants of demographic and biological characteristics; age, residence, regional and socio-economic factors, education and wealth quintile influences in unmet need and demand for child spacing in Maldivian community.

1.6 scope of the study

The demographic term, unmet need for child spacing is commonly used to understand the situation of women of reproductive age who are married or in a union and those who are fecund and sexually active but are not using any method of contraception, and report wanting to delay the birth of their next child. (WHO, 2010)

The main community to be focused via this study is Maldives. Maldives is a land separated country by sea containing 196 officially inhabited islands, another 84

islands are used as resorts, and 14 islands serve industrial purposes. The capital of Malé, with an area of about 2 sq km, accommodates one-third of the country's population of about 300,000.

The population of the republic of Maldives is distributed on 195 inhabited islands among a total of 202 inhabited islands. Each inhabited island is an administrative unit with an island office that handles island-based affairs. The islands are regrouped to form atolls, a higher-level administrative unit with an atoll office and an atoll chief.

There are 20 atolls in total in the republic. The capital city of Malé and the two surrounding islands, Villingili and Hulhumale, form a special atoll. The 21 atolls are regrouped to form six geographic regions according to their location. Malé atoll alone forms a region. In Maldives, there is no urban rural designation for residential households within an atoll. All residential households in the 20 atolls outside of Malé are considered rural; all residential households in Malé are considered urban. Refer to Appendix A for the map of Maldives that is being used in this study.

Since Maldivian culture and law necessitates the entire Maldives to follow Islamic religion, any Maldivian who does anything against Islamic religion is punishable under Maldivian laws and regulations. Maldives, as mentioned before, is a country with lands separated by sea. Therefore, each and every service is to be distributed among all the populated islands in order to provide ease of accessing to the services by the citizens. The people of the islands with no such services have to travel to the closest island where services are available, to get what they want. Most people from the islands travel to the capital city of Male' for most services and sometimes, they tends to settle and start their life in Male'. This has lead Male' to have one by third of

overall Maldivian population. Majority of the population settle in Male' for education and employment, and some settle to seek medical care.

As the Maldives is the main area to be covered in this study, the main model or scope of the study is to recognize the status of the mentioned demographic and socio-economic characteristics and how much it has influenced the demand and to create the unmet need for child spacing in Maldives.

CHAPTER 2

LITERATURE REVIEW

2.1 theoretical frame work

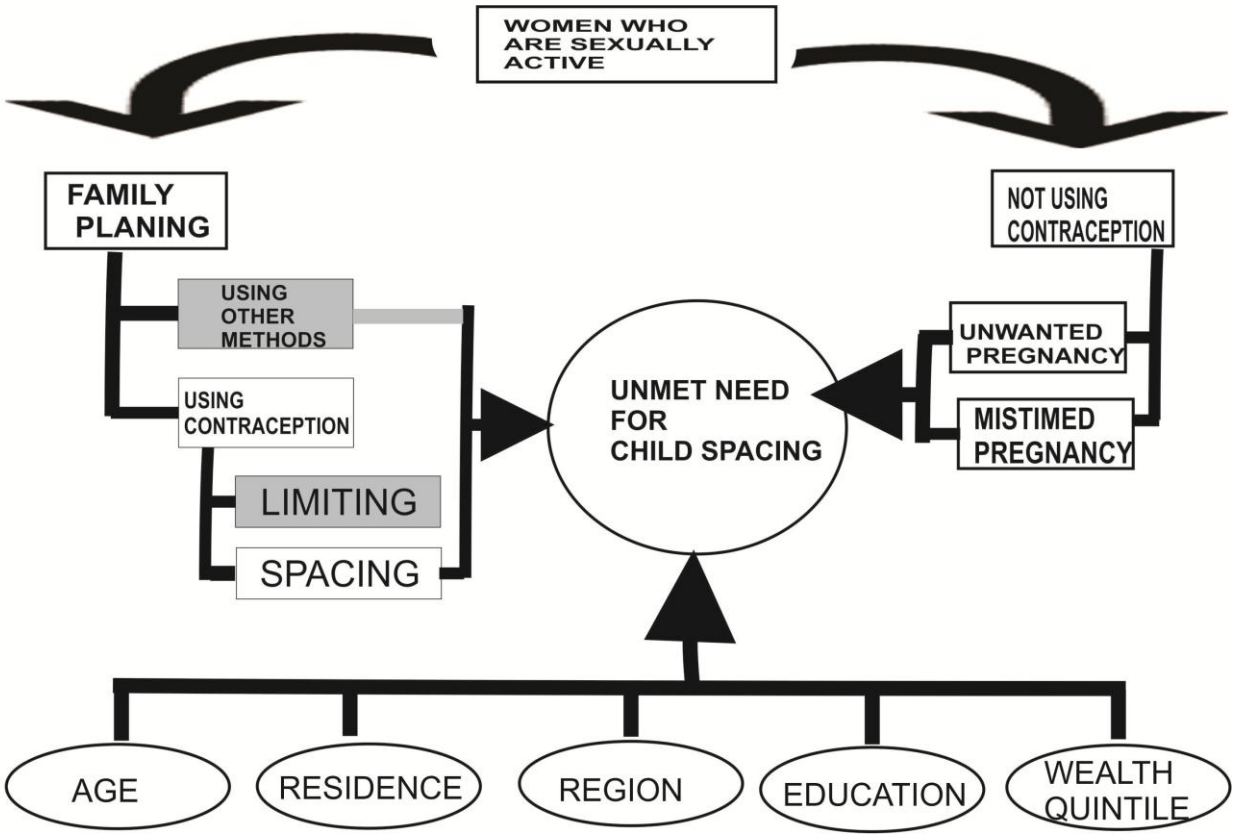

Figure 2.1: the theoretical frame work

2.2 previous studies

Women is not only labeled as the ones who are responsible for safe keeping and carrying another human being into this world, but also they are considered to be equally responsible with men in finding a way to bring up their children. For this huge responsibility, a woman should be suitably fit in every portion of the role. That

includes the women being, physically, emotionally and financially fit. (BIRTH.COM.AU, 2013)

In order to be physically fit, women should be healthy in every biological feature of reproductive and child bearing role of human being. In order for the women to be biologically fit for their role of reproduction, it is very important for a woman to have acquired puberty. Puberty is the period of human development during which physical growth and sexual maturation occurs. (farlex, 2013) Women's puberty occurs usually between 8 and 13 years. During puberty, the most evident change that occurs is the beginning of menstrual cycle. It is the periodical bleeding from the vagina of the girl, and it is known as menstruating. This bleeding is an indication that the girl's body is prepared for reproduction. (pillinger, 2013) Once the women began to have her menstrual cycle, she is very much likely to get pregnant if she is sexually active.

Most of the changes involve in the menstrual cycle is the buildup of the lining of the uterus, in step with the release of an egg (ovulation) so as to provide an environment to accept a fertilized egg, followed by the breakdown of this tissue if the egg is not fertilized. When the lining of the uterus is broken, it results in a flow of blood and tissue. This phase, which lasts only about 4-5 days, is called menstruation. Counting from the first day of bleeding, an egg is normally released at about day 14 in the middle of the cycle, although there is some variation, and the cycle length may also vary. (steane, 2013)

Usually hormones that are produced in the body of the women are responsible for these changes in the reproductive system of the women. Addition to this, these hormones are responsible for preparing women's body for breastfeeding for the baby after giving birth to the baby. Breast milk is the only food that should be given to the

newborn. Breast milk contains all the nutrients and the antibodies that are important for baby's survival during the first year of baby's life.

These are the biological changes that occur in a women body for the women to be physically fit to undergo a healthy pregnancy and child birth.

Addition to being physically fit, to be emotionally fit, a women should have full confidence for the self that she is going to have necessary security for bringing up the child that she is about to conceive. This security can either be financial or getting protection for herself and her child. For this security, women usually depend on their male counterparts. According to marriage experts, people believe that marriage is the most consistent way of having confidence of security of their children and family. (Coontz, 2007) Even though, most of the population believes marriage as the most dependable way of bringing up a child, having a child before marriage is quiet common all around the world.

2.2.1 Women who are sexually active

Marriage is a commitment made by a male and female, in equally contributing themselves in every road of their life. Being married is one of the many methods women to be sexually active in socially acceptable way.

In the Maldivian context, 18 years is the officially permitted age for women to get married. Addition to this, premarital sex is illegal and unmarried pregnancies are punishable under Maldivian law, considering through marriage is the only socially acceptable path to having children in Maldives. (right to education project, 2006) Even though women are sexually active out of wedlock, they are at risk of getting pregnant. According to W.H.O the women age between 15-49 years is very much

likely to get pregnant. Addition to this, women who are not even ovulating can get pregnant if she is sexually active. (teen Health FX, 2013)Therefore it is important for women and men alike, to act responsibly and use contraception and family planning methods to avoid unplanned pregnancies and consequences that may occur from one.

2.2.2 Family planning

Family planning is a widely used and accepted as a reliable method of having healthy children around the world. Family planning is planning anticipated to determine the number and spacing of one's children through effective methods of birth control. (an encylopedia britannia company, 2012) Family planning can either be for limiting children or spacing between two children. The most common procedure in family planning is using contraceptive methods for the particular need of family planning for spacing between children or for limiting the child birth.

Looking into the common contraceptive methods used by the Maldivians for family planning, as the table 1.1 shows the most of couples used pill and barrier method commonly known as condoms for child spacing. Female and male sterilization methods are commonly used to stop births.

Table 2.1 – Types of contraceptive methods used in Maldives in 1999 and 2004

Table 23. Mix of contraceptive methods in 1999 and 2004 in married women. Number (%)		
Methods used	No (%) of respondents	
	1999	2004
None	1258 (58%)	1507 (61%)
Pill	273 (13%)	325 (13%)
Injectables	60 (3%)	61 (3%)
Condom	140 (6%)	227 (9%)
Female sterilisation	207 (10%)	170 (7%)
Male sterilization	10 (1%)	14 (1%)
IUCD	24 (1%)	41 (2%)
Diaphragm	1 (-)	0 (-)
Norplant	8 (-)	4 (-)
Traditional methods	200 (9%)	130 (5%)

Source: RH survey Maldives 2004

Additions to this, half of the married women in the reproductive age of Maldives who do not want children, uses contraceptive methods for family planning. And among most of the reproductive aged women who desire no more children use the sterilization method as contraception.

Furthermore, family planning for spacing between children is common among the reproductive aged women with one or more children in the Maldivian community. Basing on the reproductive health survey conducted in 2004, awareness of contraceptive methods has been increasing in the Maldivian community since 1999. Therefore governments' responsibility in providing contraceptive methods to meet the increasing demand of Maldivians should be increased. (Ministry of Health, 2004)

2.2.3 Using contraceptives for child spacing

Child spacing refers to the time interval from one child's birth date until the next child's birth date. Researchers agree that 2 to 3 years between births is usually best for the well-being of the mother and her children. (UTAH department of health, 2013)

Looking into the situation of other countries, in Nigerian demographic health survey, more than 30% of women do not spend proper time period between their births. This has lead more than 80% to have risky pregnancies leading to maternal death and sometimes infant death. (National Population Commission, 2008) Child spacing provides times for infant and mother to recover from birth experience and to become well and healthy again. Addition to this, this time period between births allow women to give more attention to her husband and more care to her new born child. This will indeed strengthen the family. (State Council of Ulama, 2003)

The main method used for family planning in child spacing is using contraceptive methods. The common contraceptive method that is being used worldwide for child spacing is natural method. (Health, 2012) However this is not the most effective method for spacing between births or child spacing.

Additions to this, there are some women who are not using any contraceptive method for spacing between children. But still they want a gap or a certain time between their children. These women are described as the women with unmet need for child spacing. (United Nations DESA- population division, 2011)

2.2.4 Not using contraceptives resulting unwanted or mistimed pregnancy

Women who are not using any contraceptive methods are very likely to get pregnant leading to an unwanted pregnancy or a mistimed pregnancy. According to a research done in Tanzania, although 49.3% of the women intended to become pregnant, 50.7% (34.9% mistimed and 15.8% unwanted) became pregnant unintentionally. (Amon Exavery, 2013) (Najman JM, 1991) Mistimed and unwanted pregnancies pose critical public health risks, and their harmful consequences have been documented in many studies. For example, existing evidence shows presence of a relationship between unintended childbearing and several adverse health outcomes such as maternal depression, anxiety and poor psychological wellbeing.

Child spacing methods are required soon after giving birth. The time period of women spending after giving birth is usually known as postpartum. Women within postpartum have special needs and concerns when it comes to contraception. Basing on their health status, it is vital for them to use contraception either for spacing between the newborn and the next child or for limiting child birth. (Aschwanden, 2005)

Decisions about whether to use family planning services for limiting or spacing and selecting a contraceptive method are often deeply influenced by social factors, such as social norms around postpartum, sexual activity, use of family planning services, religious beliefs, social support, cultural traditions, myths and rumors, local and national policies and the role of women in reproductive health decision-making. These can lead to unwanted or mistimed pregnancies as well.

2.2.5 Unmet need and demand for child spacing

Married and pregnant women whose pregnancies are unwanted, mistimed, who became pregnant because they were not using contraception, those who recently gave birth but are not yet at risk of becoming pregnant because they are pregnant or amenorrhea and their pregnancies were unintended are also considered to have unmet need.

An analysis of data from 17 countries revealed a higher than 60% average rate of unmet need for family planning during postpartum period. (Chelsea Cooper, 2012) Having this unmet need, among the women in this time period, suggests that there is a demand for contraceptive methods within the women in postpartum period.

Therefore having an unmet need for family planning in child spacing is associated with having a demand in certain communities for family planning in child spacing service. In order to understand this concept, it is important to acknowledge whether the demands for the family planning services are met with that of community needs. The unmet need is created when the people are not getting their requirement fulfilled. Therefore, the reasons and the areas where the demands are met and the areas where demands are unmet with the need should be identified to understand the unmet need of child spacing in Maldives.

2.2.6 Factors influencing the unmet need of child spacing

As mentioned before, not using contraception for family planning creates unwanted or mistimed pregnancies leading to certain instabilities within the family, it is important to be aware of the reasons or contributing factors for those women in not using contraception creating an unmet need for child spacing within the community. The

background characteristic that influences in demand and unmet need for child spacing includes, Age; residence; region; education and wealth quintile.

2.2.6.1 Age influencing demand and unmet need of child spacing

A new study by the Guttmacher Institute and UNFPA, found that the number of women in developing countries who want to avoid pregnancy but are not using contraception declined only slightly between 2008 and 2012, from 226 to 222 million. However, in the 69 poorest countries, where 73% of all women with unmet need for contraceptives exist, the number actually increased, from 153 to 162 million women. The main reason for this increase is the rise of age of first marriage by these women. Marriages are the earliest in countries of Eastern Europe and Central Asia where the bride's average age at first marriage ranges between 22 and 25 years. At the same time, women in most countries of Central Europe marry after the age of 26. (Jessica Malter, 2012)

Almost in all European countries, the age at first marriage has been rising over the past ten years. The factors behind this trend include the general delay of family formation. This in turns leads to more unwanted pregnancies and high demand for contraceptive methods in these areas. More unwanted pregnancies in a community means they are having an unmet need for family planning. And in the case of European countries, the main factor that leads to unmet need for family planning is the age of marriage. People prefer not to have children out of wedlock as the security for their children cannot be assured in such a situation. Therefore, as age of marriage lowers this unmet need could be minimized. Addition to this, as mentioned above the age of women increases the capability to conceive decreases involving certain risks in it. The risks can either be of health matters or due to the increasing

responsibility on other matters. (Borland, 2011)Moreover, women aged 35 are six times more likely to have problems conceiving compared to those ten years younger. And by the age of 40, a woman is more likely to have a miscarriage than give birth. As Dr. Kutluk Oktay, medical director at the Institute for Fertility Preservation at the Center for Human Reproduction in New York City said, "No matter how much you take care of yourself, you can't slow down ovarian aging," (Aschwanden, 2005)Therefore women who gets pregnant at the older age bears big risks not only for themselves, but also for the child as well.

2.2.6.2 Residence influencing demand and unmet need of child spacing

Women with unmet need for spacing are more likely to be living in rural areas, have lower level of education, lower level of knowledge about family planning methods, have no work other than household chores, and have never been visited by a family planning worker. Women in rural areas are highly dependent on public clinics for family planning services, yet little information has been collected on rural family planning providers, especially on their funding and operation. (Haddis, 2011) Couples who had greatest spacing need were from Western, rural, had no education, couples living in rural residence having 0-2 children and couples who knew less methods had the highest unmet need for spacing, while those who knew more methods had the lowest levels of unmet need for spacing. (Moses Otieno Omwago, 2006)

For the 24% of U.S. residents who live in rural areas, where access to health care is often limited by provider shortages, by the absence of local services, by lack of transportation and by economic factors. Family health worker may be critically

important in the delivery of reproductive health care to women. (Sharon A. Dobie, 1998) If the people living in rural areas had access to health care, they will be able to know more about the family planning methods. Thus the demand for child spacing will increase result in decrease of unmet need for child spacing.

Millions of women living in urban areas in the reproductive age uses contraceptives and prefer to postpone their birth. This indicates that the availability of contraceptive resources and knowledge had leaded them to use these contraceptive methods. However, the child abortions are reported to be common in urban areas comparing to the rural areas. (Ravi Duggal, 2005)Abortion is also less available in rural areas than in urban settings. Approximately two-thirds of abortion services in the United States are provided in specialized, freestanding abortion clinics, which are located mostly in urban areas. (Sharon A. Dobie, 1998)

More child abortions means, more unwanted pregnancy. More unwanted pregnancies results due to high unmet need. Since the women living in urban areas engage more in abortions it shows that there is an unmet need for family planning in child spacing basing on the residential area of women.

2.2.6.3 Region influencing demand and unmet need for child spacing

According to a study done in Ethiopia, the demographic and socioeconomic factors including age, residence and region are labeled as characteristics influencing unmet need in family planning for child spacing. (Haddis, 2011) Basing on the study, the main reason for region being a contributing factor for rising unmet need in child spacing is not getting proper healthcare to the certain regions of Ethiopia. Unmet need

for child spacing is higher in the regions where the actions of family worker is less. The main reasons for less activity of family worker in certain regions are due to availability of resources in those regions. Therefore the women of these areas are quiet low in the knowledge of family planning methods thus raises the unmet need for child spacing.

One more reason for high unmet need in certain regions are, couple having to travel far to receive the family planning for child spacing. Since the couple who need family planning for spacing purposes is responsible for taking care of another child or children , this made it difficult for them to go to that far to receive the service. This causes high unmet need in different regions of Ethiopia. (Haddis, 2011)

2.2.6.4 Education influencing unmet need and demand for child spacing

Basing on a research done on reasons for having an unmet need of child spacing among women, one third of African women believe that, they are not going to get pregnant during breast feeding days. And in the case of Asia, women not using contraception for child spacing is commonly related to the concern of side effects in contraceptive methods. (Smith, 2012) This indeed is due to lack of proper knowledge about contraception and also due to not having proper education.

Addition to this, one more other reason for unmet need of family planning for child spacing among Asian women is not getting consent from their partners for contraception usage as these women were failed in making their partners understand the vital need of using contraception for child spacing, as these women lack proper

education in such situations. (Smith, 2012) Therefore, education is known as a contributing factor for rising unmet need for child spacing in the communities.

Unlike the countries in Asia, the decision for using family planning methods for child spacing in Maldives is mostly decided after discussion of both male and female. And it also suggests that involvement of male partner in deciding the usage of contraception is quiet high in Maldivian community. The high percent of women participation in taking this decision suggests that, the women of Maldives are well educated enough to take decision in the usage of contraception. Addition to this, they have been doing well in creating awareness among their males about the contraceptive usage as well.

Table 2.2 Decision makers in using contraception in Maldives

Table 30. Decision maker and use of contraception in married women 15-49 yrs	
Decision maker	Number (%) using modern contraception
Self	75/198 (38%)
Spouse	82/269 (31%)
Both	676/1733 (39%)
Never discussed it	9/273 (3%)

Therefore, education plays a vital role in contributing the demand and unmet need for child spacing all across the world.

2.2.6.5 Wealth quintile influencing demand and unmet need for child spacing

The study in Zimbabwe shows that higher levels of education, higher household wealth quintile, and work outside home are associated with higher levels of contraceptive use and lower levels of unmet need. (Magure et al, 2010)

Usually, higher education is possible for those women whose wealth quintile is good. The highest level of education achieved varies greatly according to wealth, with a positive association between higher reported levels of education and higher levels of household wealth. (babara janowitz et al, 2010)Since knowledge is directly proportional to increasing awareness of child spacing methods, the educated and wealthier women will have more access to these methods.

Furthermore, some of the child spacing methods are known to be costly, making it unaffordable for poor women to reach. This also provides better chance for wealthier women to have access to child spacing methods comparing to the poorer women.

According to a study done in India, the number of children that women consider to be ideal and their number of living children is negatively associated with wealth. The wealthiest women surveyed, for example, want almost a full child less than the poorest women. However, the poorest women have an average of 1.5 children more than the wealthiest women. (babara janowitz et al, 2010) The main reason for this is wealthier women can get healthcare much more easily comparing to the poor women. This leads to more children for poor women comparing to the wealthier women.

These determinants are considered to be the main factors that influence unmet need and demand child spacing worldwide.

CHAPTER 3

METHODOLOGY

The methodology of the research highlights overall data collection methods that were used in the research. For this, the data collection methods used for compiling a literature review for the research is also been included. Addition to this, the methodology used for obtaining a clear result is also to be included. Furthermore, the population that is been used to collect data and the instruments used to collect data is also being included in this part of research.

In order to complete the research, quantitative data collection method was utilized basing on the data collected in Maldivian Demographic health survey 2009. Demographic health surveys are household surveys that are conducted nationally to understand and evaluate the health indicators of a country. (Sunita Kishor et al, 2013)The Demographic and Health Surveys project, funded primarily by the United States Agency for International Development (USAID) with support from other donors and host countries. Each Demographic Health Survey is conducted by an in-country institution. The institution receives technical assistance from the Demographic Health Survey project to ensure data quality and international comparability. (Fabi, 2011)

A cross-sectional research design was used as this research is based on comparing different variables like age; residence; region; education and the wealth quintile of the

women of Maldives who took part in the study which interacts with the demand and unmet need of child spacing in Maldivian community.

In the means of finding literature review articles, health research related websites like Hinari, lancet, WHO sites and other Reproductive health related journals were referred. Addition to this, peer-reviewed publications from the available journals were used. The main reason for using these websites are, the type of required information basing on the topic can only be derived from the similar sequence of events across the globe that is related to the topic. Therefore, various writings from different authors from different countries were cited, in order to get a clear understanding of the background characteristics that are interrelated with the demand and unmet need of child spacing. Furthermore, in compiling the literature review for the study, the family planning statuses of the countries across the world are compared with that of Maldivian community.

3.1 Research design

As this research is based on the secondary data derived from the MDHS 2009 data set explaining the unmet need for family planning situation is being used. The research was designed to produce data on households, women, and children for the country as a whole, for urban and rural areas, for the six geographical regions, and for each of the atolls of the country. The Maldivian Demographic Health Survey was for the most part limited to Maldivian citizens; non-Maldivians were included in the survey only if they were the spouse, son, or daughter of a Maldivian. Research was designed to complete data collection in the field to be completed within four months.

3.2 Population and sample

Since the research is supported by Demographic health survey of Maldives 2009, the samples that are used in the survey were chosen as the samples for the research as well. According MDHS 2009 Maldives population and housing census 2006 provided the main sampling frame for MDHS 2009. Addition to this, stratified multistage sampling method was used to select samples for MDHS. It was mentioned in MDHS 2009 that total 7515 households were exploited intending for a probability sampling in the survey.

In order to obtain the subjects for the survey, mainly two stages of sample selection were used in the survey. According MDHS 2009 in the first stage, using systematic selection, 270 census blocks were selected from the sampling frame.

Furthermore, 21 atolls were used as sampling stratum to achieve stratification. And samples were selected independently in each stratum according to appropriate allocation.

Moving on to the second stage of sampling which involves selecting residential households, the residential households were selected from the selected census blocks in the first stage of selecting samples. Addition to this, fixed number of 28 households per block was used to achieve equal probability systemic selection.

Moreover, the lists of selected samples were sent to island offices for updating in order to allow all the selected households to be included in the sample, and to identify the all ever married women age 15-19 in the households who were either usual residents of the households or visitors present in the household on the night before survey. All these women present in the house were interviewed in the survey. (MOH, 2009)

3.3 Instrumentation

Addition to this, house hold survey using face-to-face interview and a questionnaire was used as data collection tool in conducting the survey.

Four questionnaires were used for the MDHS 2009: the Household Questionnaire; the Women's Questionnaire; the Men's Questionnaire and the Youth Questionnaire. The contents of the Household, Women's, and Men's questionnaires were based on model questionnaires developed by the measure Demographic Health Survey program. But the questionnaire which included the family planning status, education status and the wealth quintile of the women in the households of Maldivian community is been used in carrying out this research. These questionnaires include the house hold questionnaire and women's questionnaire.

In order to analyze the data software called OpenEpi is being used. OpenEpi provides statistics for counts and measurements in descriptive and analytic studies, stratified analysis.

3.4 Data collection procedures

Data collection started from male' in order to familiarize the data collectors in the process of collecting data. Data collecting teams usually consisted of 8 members: 4 female interviewers, 2 male interviewers, 1 Field editor, and 1 team supervisor.

On arrival at the area, the field team updated the household list. This was done by visiting all households and checking the residential status of the households in the list, removing nonresidential ones, and adding new households to the list. The final revised number on the household list was then sent to the central office, which selected the households for interviews. Then the teams visited the households and fill the required questionnaire by asking questions to the residents of the house. The team supervisors observed some interviews to see that the right procedures for interviewing had been followed by the

interviewers. The team field editor checked completed questionnaires for completeness, legibility, and consistency of editing. Mistakes were corrected and, if necessary, the interviewer might have had to revisit the household to clarify or obtain the correct information from the respondent. The team supervisor also reviewed selected questionnaires.

At the beginning of the study, the responder's age, residence and education status were asked. Since women were the target group in this part of study, a female interviewer was placed to ask and fill the questionnaire.

The identified age groups of the responder are, 15-19 years, 20-24 years, 25-29 years, 30-34 years, 35-39 years, 40-44 years, 45-49 year old women.

As to collect data for residence, the capital city male' was the only area identified as urban area in Maldives and the other islands are classified as rural areas.

Addition to this, there were 6 regions identified, that includes, Male', North, North central, Central, South central and south. This data was collected by identifying the region where the responder lives.

The educational status was divided into four main categories, which include, women with no formal education (who had never attended to school), Women with primary education, women with secondary education and finally women with more than secondary education.

To collect the data about the wealth quintile of the women, women were asked about the salary their family receives per month. And the answers were divided among lowest, second, middle, fourth and highest category.

In order to understand the unmet need and demand for child spacing, the women were asked about the number of children they currently had, and their desire in getting pregnant again.

Addition to this, they were asked about the contraceptive methods they knew and the types of methods they wish to use and for the purpose of using the contraception.

When completed questionnaires were received at the central office, all questionnaires were checked by office editors who also recorded the occupation codes. Thus the quality of the data has been maintained throughout the whole survey. (MOH, 2009)

3.5 Framework for data analysis

In order to obtain a result from the research, a cross sectional data analysis method is to be used. For this, the data available from MDHS 2009's unmet need and total demand of family planning for child spacing is compared against various determinants including, education status, residential area, region and the age of women who took part in the MDHS.

This study will examine the influence of these determinants on the unmet need of family planning for child spacing. The following formula is being used worldwide to calculate the unmet need for child spacing.

$$\text{Unmet need in family planning for child spacing} = \frac{\text{Women (married or in a union) who are not using contraception, are fecund, and desire to postpone their next birth for at least two years + pregnant women whose current pregnancy was unwanted or mistimed + women in post-partum amenorrhea who are not using contraception and, at the time they became pregnant, had wanted to delay or prevent the pregnancy}}{\text{Total number of women of reproductive age (15-49) who are married or in a union}} \times 100$$

Source: *World contraceptive use 2010*

In order to analyze the data, both inferential and descriptive statistics is been used. The data collected in MDHS 2009 is been used to analyze and derive the result to get an answer to the research question. Five determinants that influences with demand and unmet need for child spacing is measured and assessed to identify how much the determinants contribute to the indicators. The analyzed data will be represented in graphs and tables with description of the result.

Table 3.1 summary of analytic framework

Objectives	**Question**	**Sources of data**	**Type of data**	**Technique of analysis**
• Understanding the demand of child spacing in Maldives. • Understanding the unmet need of child spacing in Maldives • Acknowledging the background characteristics age; residence; region; education ad wealth quintile influences both demand ad unmet need for child spacing in Maldives.	How does the background characteristics age; residence; region; education and wealth quintile of a Maldivian women influences the unmet need and demand for child spacing in Maldives?	Maldives Demographic Health Survey 2009	Secondary data	Using inferential and descriptive statistics

CHAPTER 4

RESULTS

Basing on the MDHS 2009 data set (included in Appendix B), total of 6500 women had attended to questionnaire. And the data of the study is divided into 5 determinants which were assessed against 2 indicators of demand of family planning methods for child spacing in Maldives and Unmet need of child spacing in Maldives.

The five background characteristics evaluated against 2 indicators include age; residence; region; education and wealth quintile. Both inferential statistics and descriptive statistics are used to analyze the collected data from Demographic health survey Maldives 2009. Inferential statistics is used in describing the results of determinants age, education and wealth quintile of the women effecting on the demand and unmet need for child spacing.

The two indicators used against determinants are the demand for child spacing and the unmet need for child spacing n Maldives. Both data are taken from Maldives Demographic Health survey.

The following represents the types of statistical analyses used to analyze the results.

#	DETERMINANTS	STATISTICAL ANALYSIS METHOD	INDICATORS
1	Age	Ration difference table	demand for child spacing
2	Residence	Chi square test	unmet need for spacing
3	Region	Confidence interval table	
4	Education	Bar chart	
5	Wealth Quintile	Average table	

Table 3.1 represents the influence of age of the women on unmet need for child spacing and how the age influences the demands for child spacing methods in Maldives.

Among the 6500 women who took part in the study, 57.3% of women in the age group of 15-19 years demand the family planning services for the child spacing. Among this 57.3% of women demanding for child spacing services, 63.4% women are still with the unmet need for child spacing in Maldives.

Looking more into the ration differences comparing to the demands for child spacing services and unmet need for child spacing services in Maldives, it has been observed that, as the age of the women increases, the demand and unmet need for child spacing services decreases. But in the age group between 20-29 years, even though there is a little difference in the demand for child spacing category, the unmet need percent is equal.

And finally in the age group of 45-49 years both demand and unmet need for child spacing had decreased and basing on the demand for child spacing services, the unmet need for child spacing is 42.9%.

TABLE 3.1 : Influence of age on the demand and unmet need for child spacing in percentage

Age category (in years)	Child spacing		
	Demands	Unmet need	Ratio difference
15-19	57.3	36.3	63.4
20-24	47.6	26.3	55.3
25-29	45.7	25.3	55.4
30-34	27.6	13.5	48.9
35-39	13.5	6.1	45.2
40-44	4.9	2.4	49.0
45-49	0.7	0.3	42.9

Looking into the influence of residence on demand and unmet need for child spacing, a chi square test was performed to assess the significance of a difference in the percentage of demand and unmet need of child spacing in rural versus urban setting. In order to get a result from the collected data of MDHS 2009, first the total number of women demanding for child spacing was calculated as an observed frequency and expected frequency was calculated using the appropriate statistic formula.

Basing on the result, it was found out that, the chi square test showed, $X^2 = 1.53$. And when two-tailed uncorrected chi square p value was calculated, it showed $P > 0.01$. This suggests that there is no evidence towards a significant difference in percentage of demand for child spacing between women who live in urban and rural areas.

Addition to this, same method was repeated to assess the significance of difference in percentage of unmet need for child spacing among the women living in urban and rural are of Maldives.

As expected the result showed that there is no evidence towards a significant difference in percentage of unmet need for child spacing between women who live in urban and rural areas, as the chi- square test result was $X^2 = 1.99$ and p-value $P > 0.01$. the calculations for chi-squared test follows in Appendix C.

Since the residence of Maldives covers a great area of Maldives, In order to be specific it has been decided to find out the demand and unmet need for child spacing in several regions of the Maldives.
Confidence interval was calculated among the highest and lowest areas with the demand and unmet need for child spacing.

According to the data set from MDHS 2009, the highest demand for child spacing is in the North region of the region of the Maldives. And the lowest demand for child spacing is found to be in south central region of the Maldives. Therefore these two regions were compared to assess whether there is any true difference between these two regions of Maldives. The calculation for calculating 95% confidence interval follows in Appendix D.

95% confidence interval was calculated for the difference in proportion between two regions. And it was found out that, the 95% confidence interval for the proportions of demand for child spacing among north and south central region of Maldives is (95% C.I= $-6X10^{-3}$ to 0.078). This suggests that, there is no true difference between two proportions of demand for child spacing among north and south central region of the Maldives.

Furthermore, the same data set from MDHS 2009(refer Appendix B) was used to find out whether there is any true difference between the region with highest unmet need for child spacing and the region with lowest unmet need for child spacing or not. The region with highest unmet need for child spacing is the south region of Maldives and the region with lowest unmet need for child spacing is the central region of the Maldives.

And when 95% confidence interval was calculated for both regions and it was found out that the 95% confidence interval is (95% C.I-= 0.0262 to 0.0998).

This suggested that a true difference exists between the proportions o unmet need for child spacing among the south region and central region of the Maldives.

This answer required to do further analysis to understand the situation of unmet need among the south region and with the rest of the Maldives. Therefore, proportions of 5 regions, male'; north; north central; central and south central was compared against the proportion of south region of Maldives.

When 95% confidence interval was calculated among the proportion of five regions of the Maldives and the proportion of south region of the Maldives, it showed that 95% confidence interval is (95% C.I = 0.030502 to 0.08148) This suggests that a true difference exists between the proportion of unmet need for child spacing in south region of Maldives comparing to the rest of the Maldives.

The following table interprets the findings of the results of the regions.

TABLE 4.2: Difference in population of demand and unmet need for child in regions of Maldives

INDICATOR	REGIONAL COMPARISATION	95% CONFIDENCE INTERVAL
Demand	north and south central	-6x10-3 - .0.078
unmet need	south and north	0.0262-0.0998
unmet need	south and all other regions	0.03052-0.08148

Looking into the education status of the women who took part in Maldives Demographic health survey, it is seen that, women in each level of education has high demand for child spacing methods in Maldives, while the unmet need for child spacing covers the half of demand for child spacing services.

When comparing the data the demand for child spacing services increases as the educational level of the women increases. And looking into the data of unmet need for child spacing among the women with secondary and more than secondary education, it has seen that the unmet need is high among the women with secondary education comparing to the women with more than secondary education whilst the demand for child spacing services stays same among women in both category.

The following bar chart represents the influence of education of the women in the demand and unmet need for child spacing in Maldives.

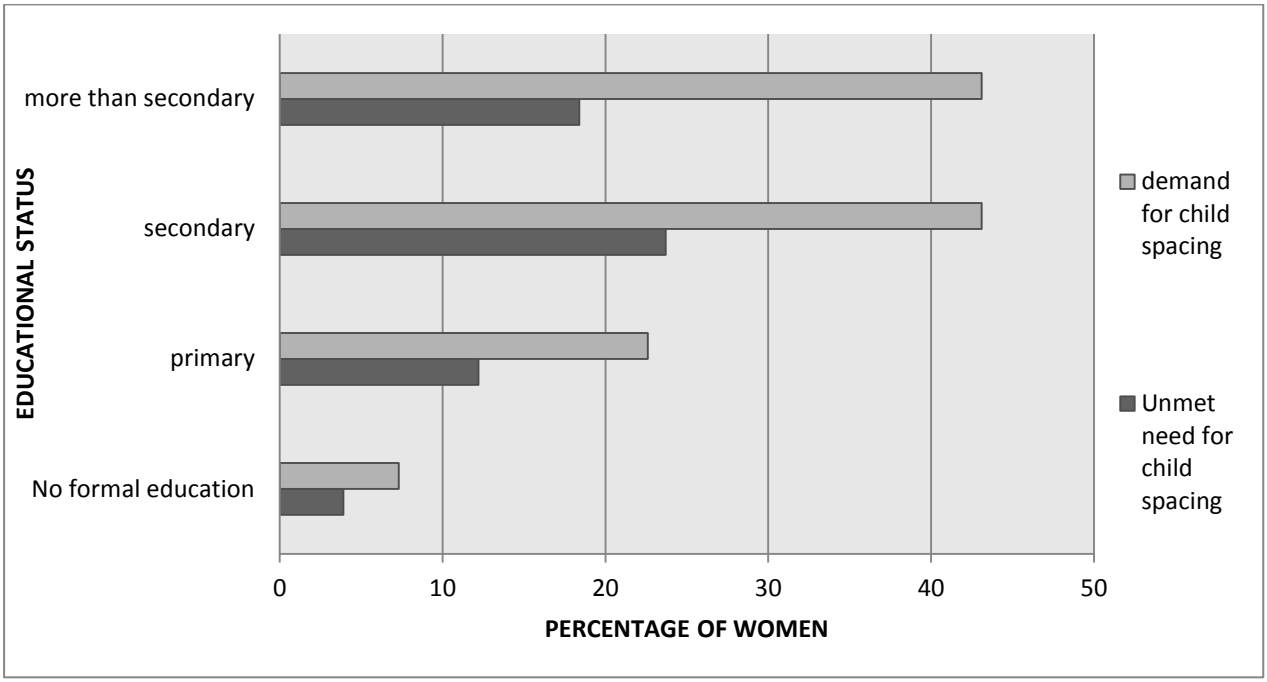

Fig 4.1: Percentage of women comparing to the educational status

Finally, the table 4.3 following shows the average percent of women in each wealth quintile range demanding for child spacing services and the average percent of women in each wealth quintile rage with the unmet need for child spacing services basing of Maldives Demographic Health survey 2009.

Looking into the data of wealth quintile in Maldives, there are 5 categories highlighted. That includes, women living in the lowest wealth quintile, women living in the second wealth quintile range, middle wealth quintile range, fourth wealth quintile range and woman living in highest wealth quintile range basing on Maldivian community.

Basing on the result, the average percent of women demanding for child spacing services is 27.8% which is almost equal in every range of wealth quintile in Maldives. At the same time the unmet need for child spacing average is noted as 14.9% and women living in each wealth quintile range are having almost equal data with the calculated average. Therefore, it seems that there is almost no difference among the unmet need for child spacing in the wealth quintile range in Maldives.

TABLE 4.3 : Influence of age on the demand and unmet need for child spacing in percentage

	child spacing	
wealth quintile	demand	unmet need
lowest	26.0	14.2
second	28.2	15.8
middle	27.9	14.4
fourth	28.8	15.9
highest	28.3	14.3
Average	27.84	14.92

CHAPTER 5

DISCUSSION AND CONCLUSION

5.1 Summary of main findings

As indicated in the result, as the background character age increases so does the demand for child spacing. Unlike this, as age of the women increases the unmet need for child spacing decreases. Addition to this, it was found out that the residence area has no significant difference for demand or unmet need for child spacing in Maldives. However, the south region of Maldives seems to be having true difference comparing to the rest of the Maldives in unmet need for child pacing even though no true difference exists in demand for child spacing among all the regions of Maldives.

Comparing the statistics of the women in different educational levels in Maldives, it is noticed that, the women with secondary education is having higher unmet need for child spacing than the women with other educational levels.

And finally, the result suggested that, the wealth quintile of the women has no effect on either demand or unmet need for child spacing in Maldives.

5.2 Discussion

According to the data set from DHS survey (refer Appendix B), as the age of women increases both, demand and unmet need decreases. Since age has lots of other biological factors in it, as the age of the women increases, the needs decreases.

The main reason for this can be the risks which are involved in getting pregnant in the later stage of child bearing age.

Addition to this most of the women above age 35 years in Maldives, devote themselves in bringing up their children rather than planning to conceive another child. In addition to dedicating themselves into taking responsibility of their children, most of the women in later child bearing age withdraw themselves from seeking family planning methods for child spacing due to their age. This has led many women in these ages to use sterilization methods of family planning and stop them from getting pregnant. This reduces the demand and unmet need among the women in later child bearing age.

Looking at the age group below 35 years from the Maldivian demographic health survey data set, they are having high unmet need and demand for child spacing. Since the age groups between 15-35 years of age are known to be most fertile age of women, they are more likely to seek the family planning services. This increases the demand for family planning among this age group.

Even though women of this age group demands for more family planning methods for child spacing, they are not getting their demands fulfilled at the rate of their demand. This results in high unmet need in this age group. And as the study from, Guttmacher Institute, the United Nations Population suggests, since the age of marriage increases, it leads the unmarried people at younger age demanding more contraception methods. And it is very unlikely to meet with their demand thus results in unmet need for family planning. However, in the case of Maldives, the unmet need for family planning in child spacing is measured only among the married couples, leaving the unmarried people. But it’s a known fact that unmarried couple do get pregnant in

Maldivian community. Their need for using contraception will be very high as they will have the fear of getting punished for getting pregnant illegally.

As expected, there is no evidence towards a significant difference in percentage of demand or unmet need for child spacing between women who live in urban and rural areas.

The main reason for this could be that, unlike the other countries, the rural areas do not have that much difference comparing to the urban areas of Maldives. Since education is provided in each and every island without considering urban or rural, it is very much likely that, the women living in rural areas are as much as educated as a women living in urban area of Maldives. Therefore, a woman living in a rural area could be having knowledge about child spacing methods as much as a woman living in an urban area. This in turns lead the women living in rural area to have almost no difference in the demand and unmet need for child spacing in Maldives.

Addition to this, unlike other countries, Maldives is a land separated country in which there is dispersed population in these dispersed islands. And a health care facility with health care professional is located in each of these islands with a population. Since the islands of Maldives are really small it is not very difficult to access the health care whenever required. This has lead for the women to be aware of the child spacing methods and seek the child spacing methods whenever needed.

As indicated in literature review about the increasing number of child abortions in urban areas showing the high unmet need for child spacing in urban areas, there is no study done in Maldives about the child abortions yet. Therefore, it will be difficult to

judge the unmet need relating to child abortion in these areas as the relevant data is not available about the child abortions in Maldivian context.

One of the interesting findings was from the region influencing the demand and unmet need for child spacing in Maldives.

As designated in the result, there is no true difference for the demand for child spacing among all the six regions of the Maldives. This could be that the women living in each region having equal knowledge and awareness about the child spacing methods. If two people are having equal knowledge about something, they will definitely have equal demand for that. For this reason no true difference was calculated among six regions of Maldives.

Looking into the unmet need for child spacing among six regions of Maldives, the south region of Maldives seems to be having high unmet need for child spacing comparing to the other regions of Maldives. To make sure whether a true difference exists in unmet need for child spacing in south region, confidence interval comparing south region and rest of the Maldives was calculated. And the result showed that a there is a true difference between south region and rest of the Maldives in unmet need for child spacing.

When trying to figure out a motive which could be responsible for high unmet need in Maldives, the average population of south region is more comparing to other regions excluding the capital city Male' in Maldives. It was also found that, the islands that represent south region of Maldives are slightly larger in size and average population in contrast to islands in other regions.

For these reasons, just like other Ethiopia it could be difficult for the women of south region to access healthcare for child spacing methods even though they have knowledge about these methods. Addition to this, due to comparatively large population in south region, the health care professionals could be failing to reach each and every woman of south region to provide child spacing methods in order to fulfill the demand for child spacing among the women of south region in Maldives.

However, further studies can be carried out to deeply understand these reasons for high unmet need for child spacing among the women in south region of Maldives.

Looking at the figure 4.1 representing the graph of the status of the education, as the education level of women increases, both unmet need and demand for child spacing increases. Women with no formal education have less demands and less unmet need for child spacing comparing to the women with primary education level.

The main reason for this is the women with no formal education have less knowledge and are blissfully unaware of contraceptive methods. For instance, she might not be able to read a leaflet about contraceptive methods which she might come across. In contrast to that, the women with primary education will be able to read, understand and increase her knowledge on contraceptive methods and she is very much likely to apply her knowledge in making decisions for using contraception.

And in the case of women with secondary education and women with more than secondary education, the data set shows they were having equal demand for child spacing but the unmet need for child spacing is lower among the women with more than secondary education. Since it is very much unlikely to have equal demand for

child spacing among these two groups, the variation in unmet need area can be weighed.

The women with more than higher secondary education will definitely have knowledge about contraception and they will seek these methods leading them to have less unmet need for child spacing comparing to the women with secondary education.

The woman with secondary education seems to be having higher unmet need for child spacing comparing to the women in other education levels. The reason for this could be that, the secondary education level women might be feeling shy in requesting for child spacing methods, or it could be due to them having different cultural beliefs.

However, this is an important study area to identify the reasons that are causing high unmet need among the women with higher secondary education.

This results is having variation in the demand and unmet need of child spacing among the women with different educational status.

Having proper knowledge and awareness of these methods by the educated women means she provides this information to her partner and both of them equally contributes in making a decision of using family planning methods for child spacing.

Looking into the statistics of Maldives Demographic health survey 2009, the wealth quintile of the women in Maldives seems to have no difference on the demand or unmet need of child spacing. As the table highlighted, all the women in different wealth quintile range seems to be having average demand for child spacing and average unmet need for child spacing as well.

Unlike other countries like India, there are no poor people recorded in the country. Each and every citizen of Maldives gets to eat every day and they do have shelter. No

one gets to sleep on the road due to not having a home or a place to live. In other words, the basic needs are fulfilled for every citizen. Addition to this, the family planning services for child spacing is free in all the islands of Maldives. A healthcare provider in each island provides these services and promotes family planning methods for each and every married couple in the island. Therefore, no married couple has to afford to buy these child spacing services and they get to have free access to child spacing services.

For these reasons the wealth quintile of the women has no effect on the unmet need or demand for child spacing services in Maldives.

5.3 Implications

Maldivian community is an interesting community to study, as the population of Maldives is scattered over different islands located in dispersed atolls. For this reason, the demand and the requirements of the islanders could differ from each other. Hence, it will be quiet interesting to acknowledge the factors that lead to these variations in the demands of the islander. Therefore, more studies can be carried out all across the Maldives and up to date information can be collected to create better understanding of the true situation of Maldivians.

Usually it takes a lot of time and a lot more resources to carry out a perfect study about Maldives. So it is important to start such a study about Maldives after good planning and appropriate time should be spent on completing the study at its best level.

5.4 Limitations of the study

It is very unlikely that a study can be completed without dealing with any error or lack of information from the necessary field. While completing this study, the main challenge was due to lack of up to date information. The data set used for this study was derived from a survey which was conducted on 2009. And till today no other study has been conducted in this field in Maldives. Addition to this, it was difficult to get critical data from the Maldivian census, as no recent census data are available. Furthermore, lots of errors are found from the used data set including exceeding the total number in the factors from the total sample size and repetition of data. These led to great difficulty in analyzing the data.

5.5 Directions for future research

After analyzing and deriving a result from the MDHS 2009 data set, many more interesting fields to study was identified.

Looking into details, it was found out that, the women with secondary education are having higher unmet need for child spacing comparing to the women with lower education level in Maldives. The reasons that lead to this can be identified by conducting further studies and finding more reliable data sources.

Addition to that, this study revealed that, the unmet need for child spacing is higher in the south region of Maldives comparing to the rest of the Maldives. There could be an interesting fact that created this high unmet need for child spacing situation among the women in south region of Maldives. For this, a proper study can be carried out and acknowledge the cause of this situation.

These studies will create better understanding of the unmet need for child spacing situation in Maldives and can overcome this and this in turns will produce a healthy happy community in Maldives.

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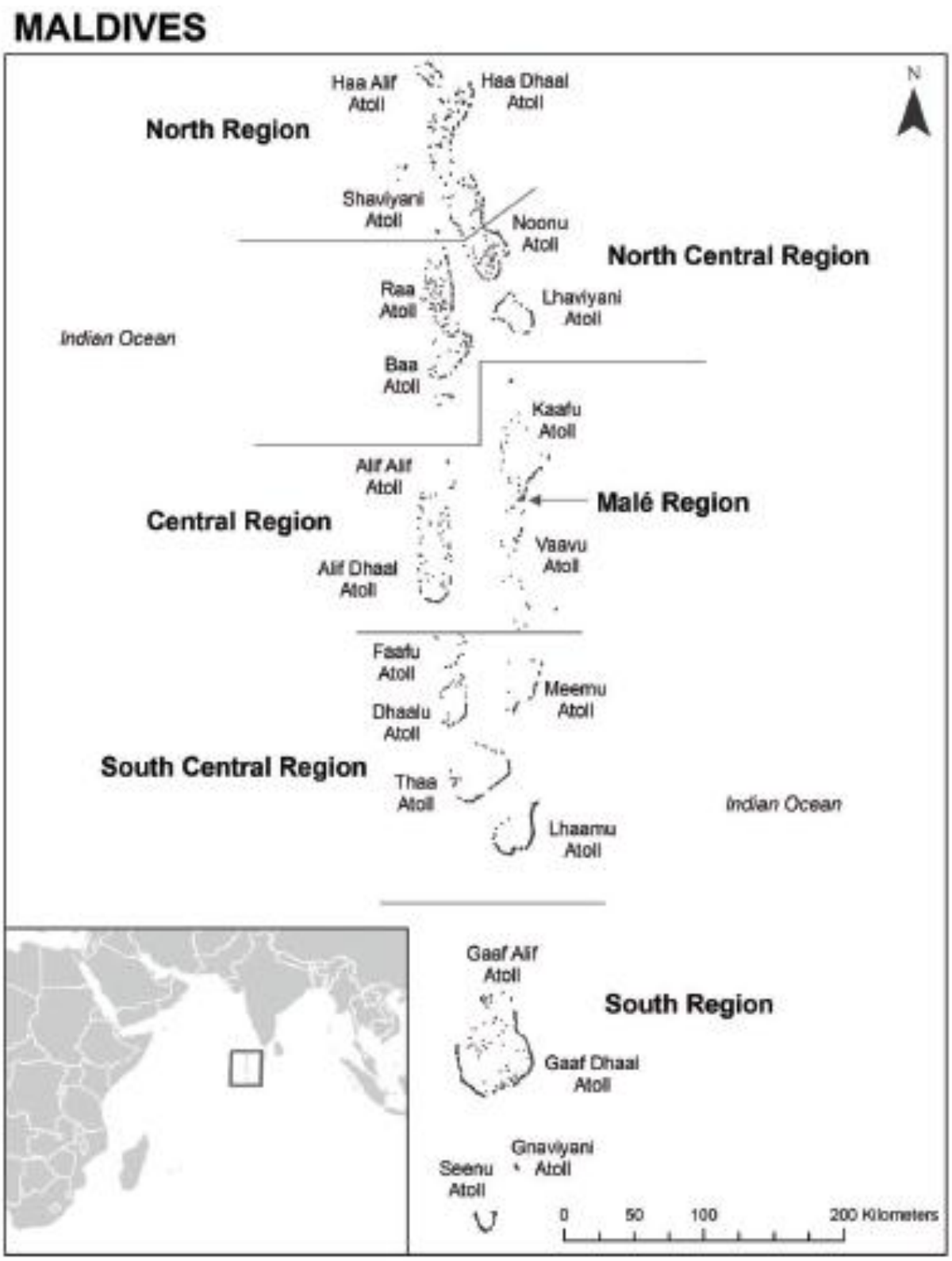
Appendix A


MALDIVES
N
North Region
Haa Alif Atoll
Haa Dhaal Atoll
Shaviyani Atoll
Noonu Atoll
North Central Region
Raa Atoll
Lhaviyani Atoll
Indian Ocean
Baa Atoll
Kaafu Atoll
Alif Alif Atoll
Malé Region
Central Region
Vaavu Atoll
Alif Dhaal Atoll
Faafu Atoll
Meemu Atoll
Dhaalu Atoll
South Central Region
Thaa Atoll
Indian Ocean
Lhaamu Atoll
Gaaf Alif Atoll
South Region
Gaaf Dhaal Atoll
Gnaviyani Atoll
Seenu Atoll
0
50
100
200 Kilometers

Appendix B

Table 7.3 Need and demand for family planning among currently married women

Percentage of currently married women age 15-49 with unmet need for family planning, percentage with met need for family planning, the total demand for family planning, and the percentage for the demand for contraception that is satisfied, by background characteristics, Maldives 2009

Background characteristic	Unmet need for family planning[1]			Met need for family planning (currently using)[2]			Total demand for family planning			Percentage of demand satisfied	Number of women
	For spacing	For limiting	Total	For spacing	For limiting	Total	For spacing	For limiting	Total		
Age											
15-19	36.3	0.0	36.3	15.0	0.0	15.0	57.3	0.0	57.3	36.6	111
20-24	26.3	5.2	31.5	20.2	3.0	23.2	47.6	8.4	56.0	43.7	1,188
25-29	25.3	8.8	34.2	19.2	10.8	30.0	45.7	19.7	65.3	47.7	1,446
30-34	13.5	16.6	30.2	13.4	21.7	35.1	27.6	38.6	66.2	54.5	1,193
35-39	6.1	18.1	24.2	7.1	36.9	44.0	13.5	55.3	68.9	64.8	1,065
40-44	2.4	20.8	23.2	2.5	42.8	45.3	4.9	63.8	68.8	66.3	884
45-49	0.3	15.7	16.0	0.4	39.2	39.7	0.7	54.9	55.6	71.3	612
Residence											
Urban	14.0	12.2	26.2	12.1	21.5	33.6	26.9	33.9	60.8	56.9	2,122
Rural	15.3	13.7	29.1	12.3	23.0	35.3	28.4	36.9	65.2	55.4	4,378
Region											
Malé	14.0	12.2	26.2	12.1	21.5	33.6	26.9	33.9	60.8	56.9	2,122
North	13.5	11.8	25.4	15.6	23.8	39.4	30.4	36.0	66.4	61.8	1,009
North Central	14.4	12.6	27.1	13.8	23.6	37.4	28.5	36.4	64.8	58.3	967
Central	13.3	11.8	25.1	14.0	28.0	42.0	27.7	40.0	67.7	62.9	563
South Central	14.7	15.9	30.5	11.4	20.3	31.7	26.8	36.3	63.0	51.5	789
South	19.6	16.0	35.6	7.5	20.9	28.4	27.9	36.9	64.9	45.2	1,051
Education											
No formal education	3.9	19.8	23.8	3.2	40.4	43.6	7.3	60.5	67.8	64.9	1,488
Primary	12.2	15.3	27.4	10.1	26.8	36.9	22.6	42.2	64.8	57.6	2,216
Secondary	23.7	8.4	32.1	18.0	9.3	27.3	43.1	17.9	61.1	47.4	2,409
More than secondary	18.4	6.8	25.2	23.6	9.1	32.7	43.1	15.8	58.9	57.3	316
Wealth quintile											
Lowest	14.2	14.6	28.8	11.1	25.9	36.9	26.0	40.8	66.8	56.9	1,167
Second	15.8	13.6	29.4	11.8	23.7	35.4	28.2	37.4	65.6	55.2	1,278
Middle	14.4	14.3	28.7	12.7	21.6	34.3	27.9	36.0	63.8	55.1	1,363
Fourth	15.9	12.8	28.7	12.3	21.1	33.4	28.8	34.0	62.8	54.4	1,311
Highest	14.3	11.1	25.4	13.1	20.9	33.9	28.3	32.1	60.4	57.9	1,381
Total	14.9	13.2	28.1	12.2	22.5	34.7	27.9	35.9	63.8	55.9	6,500

Note: Total includes 72 women with information missing on education level.

[1] Unmet need for spacing includes pregnant women whose pregnancy was mistimed; amenorrhoeic women who are not using family planning and whose last birth was mistimed, or whose last birth was unwanted but now say they want more children; and fecund women who are neither pregnant nor amenorrhoeic, who are not using any method of family planning, and who say they want to wait 2 or more years for their next birth. Also included in unmet need for spacing are fecund women who are not using any method of family planning and say they are unsure whether they want another child or who want another child but are unsure when to have the birth. Unmet need for limiting refers to pregnant women whose pregnancy was unwanted; amenorrhoeic women who are not using family planning, whose last child was unwanted and who do not want any more children; and fecund women who are neither pregnant nor amenorrhoeic, who are not using any method of family planning, and who want no more children.

[2] *Using for spacing* is defined as women who are using some method of family planning and say they want to have another child or are undecided whether to have another. *Using for limiting* is defined as women who are using and who want no more children. Note that the specific methods used are not taken into account here.

Appendix C: Chi-squared test (demand and unmet need for child spacing in rural vs urban settings)

A Chi-squared test was performed to assess the significance of a difference in the percentage of women with the demand for child spacing in rural versus urban settings.

Observed frequencies:

Residence	demand for child spacing	**yes**	**no**	total
urban	**yes**	571	1551	2122
rural	**no**	1243	3135	4378
total		1814	4686	6500

Expected frequencies:

Residence	demand for child spacing	**yes**	**no**	total
urban	**yes**	592	1530	2122
rural	**no**	1222	3156	4378
total		1814	4686	6500

Calculating χ^2 statistic:

O	**E**	**(O-E)**	**(O-E)2**	**(O-E)2/E**
571	592	-21	441	0.74
1551	1530	21	441	0.29
1243	1222	21	441	0.36
3135	3156	-21	441	0.14
6500	**6500**			**1.53**

χ^2 statistic = 1.53

Degrees of freedom = 1

Two-tailed uncorrected chi square p-value was calculated using OpenEpi program

$P = 0.2116$

$P > 0.01$ which suggests that there is no evidence towards a significant difference in percentage of demand for child spacing between women who live in urban and rural areas.

A Chi-squared test was performed to assess the significance of a difference in the percentage of women with the unmet need for child spacing in rural versus urban settings.

Observed frequencies:

Residence	Unmet need for child spacing	**yes**	**no**	total
urban	**yes**	297	1825	2122
rural	**no**	670	3708	4378
total		967	5533	6500

Expected frequencies:

Residence	Unmet need for child spacing	**yes**	**no**	total
urban	**yes**	316	1806	2122
rural	**no**	651	3727	4378
total		967	5533	6500

Calculating χ^2 statistic:

O	**E**	**(O-E)**	**(O-E)2**	**(O-E)2/E**
297	316	-19	361	1.14
1825	1806	19	361	0.20
670	651	19	361	0.55
3708	3727	-19	361	0.10
6500	**6500**			**1.99**

χ^2 statistic = 1.99

Degrees of freedom = 1

Two-tailed uncorrected chi square p-value was calculated using OpenEpi program

P = 0.2116

P > 0.01 which suggests that there is no evidence towards a significant difference in percentage of demand for child spacing between women who live in urban and rural areas.

Appendix D: Calculation of 95% confidence interval (urban rural classification)

Calculation of 95% confidence intervals for difference in proportion of demand for child spacing between the regions with highest and lowest demand for child spacing and the regions with highest and lowest unmet need for child spacing in Maldives

Standard error (s.e) for difference between two proportions was calculated using the formula:

$$\mathbf{s.e = \sqrt{[p_1(1 - p_1) / n_1 + p_2(1 - p_2) / n_2]}}$$

Where;

p_1 = proportion highest demand and unmet need for child spacing

n_1 = number highest demand and unmet need for child spacing

p_2 = proportion lowest demand and unmet need for child spacing

n_2 = number lowest demand for child spacing

95% confidence interval (C.I) for the difference between two proportions was calculated using the formula:

$$\mathbf{95\%\ C.I = statistic \pm 1.96 * s.e}$$

Where;

statistic = $(p_1 - p_2)$

Using the above formula, 95% C.I for the difference between highest and lowest demand and unmet need for child spacing proportions for these two measurements were calculated as follows;

<u>1-Demand for child spacing in North region and south central region</u>

$p_1 = 0.304$ $n_1 = 1009$

$p_2 = 0.268$ $n_2 = 789$

s.e = $\sqrt{}$ [0.304(1 - 0.304)/1009 + 0.268(1 - 0.268)/789] = 0.0214

95% C.I = (0.304 - 0.268) ± 1.96 * 0.0214

= 0.036 ± 0.042

= ($-6x10^{-3}$ to 0.078)

2- Unmet need for child spacing in south and north region

p_1 = 0.196 n_1 = 1051

p_2 = 0.133 n_2 = 563

s.e = $\sqrt{}$ [0.196 (1 - 0.196)/1051+ 0.133 (1 - 0.133)/563] = 0.0188

95% C.I = (0.196 - 0.133) ± 1.96 * 0.0188

= 0.063 ± 0.0668

= (0.0262 to 0.0998)

For further investigation, unmet need for child spacing of south region was compared against all other regions

3- unmet need for child spacing in south region and rest of the regions in Maldives

p_1 = 0.196 n_1 = 5450

p_2 = 0.1499 n_2 = 1051

s.e = $\sqrt{}$ [($1.499 x10^{-4}$) + ($2.209x10^{-5}$)] = 0.013

95% C.I = (0.196 - 0.14) ± 1.96 * 0.013

= 0.056 ± 0.025

= (0.035052 to 0.08148)