Global Scientific JOURNALS

GSJ: Volume 9, Issue 6, June 2021, Online: ISSN 2320-9186
www.globalscientificjournal.com

ASSESSMENT OF MATERNAL BEHAVIOR REGARDING SUPPLEMENTATION (FOLIC ACID) USAGE DURING PREGNANCY

By

TAHIRA KANWAL

2018-GCUF-077506

Thesis submitted in partial fulfilment of
the requirements for the degree of

MASTER OF PUBLIC HEALTH

DEPARTMENT OF PUBLIC HEALTH

GC UNIVERSITY, FAISALABAD

2018-2020

DEDICATION

Dedicated to one who gave us life and grew us up. I owe Him each moments of our life and praise Him in every breath, my parents, respected teachers and all those who appreciated me and worked to complete this research.

DECLARATION

The proposed work reported in this synopsis will be carried out by me under the supervision of Mrs Tahira Ashraf institute Afro Asian Institute affiliated with GC University, Faisalabad, Pakistan.

I hereby declare that the title of proposed research ASSESSMENT OF MATERNAL BEHAVIOR REGARDING SUPPLEMENTATION (FOLIC ACID) USAGE DURING PREGNANCY and its contents are the product of my own proposed research and no part will be copy from any published source (except the references, standard mathematical or genetic models /equations /formulas /protocols etc.). I further declare that this work has not been submitted for award of any other degree /diploma. The University may take action if the information provided is found inaccurate at any stage.

Signature of the Scholar

Name: _____

Registration No.: _____

ACKNOWLEDGEMENTS

I would like to bow our heads before **ALLAH** Almighty, the most Gracious and the most Merciful. He has been our real supporter throughout. I am highly indebted to my parents for their never-ending support and encouragement for spending their time, their resources for me and for providing me with a very comfortable and progressive work environment. My parent's special prayers that never left me alone. I would like to thank **Danish Chaudary** for his outstanding work about this research as a co-author. I Would like to thank to **Prof. Dr. Syed Amir Gilani** who allowed me to do this study and guided me. I would thank to **Supervisor Dr. Asif Hanif** for being my preceptor and for being the greatest inspiration for my work when I had no idea to perform a research work. I am indebted to him and I admire the way in which he explained very difficult concepts in very simple ways. He is very helpful in giving me suggestions. . I would like to thanks to **Principal (Dr. Muhammad Farooq Tariq Butt)**, **vice principal** (**Syed Abid Ali)**, **Office of Students affairs (Muhammad Usman), Director of student's affairs** (**Syed Ihtisham Ahmed), and Information Technology Department (Mr. Asif Qasoori),** who provided best facilities to fulfil my academic goal. I would also like to thank all the participants and my colleagues.

CERTIFICATE BY SUPERVISORY COMMITTEE

We certify that the contents and form of synopsis submitted by Miss/Mrs Tahira Kanwal, Registration No. 2018-GCUF-077506 has been found satisfactory and in accordance with the prescribed format. We recommend it to be processed further.

Signature of Supervisor …….

Name: ……..

Designation with Stamp…….

Co-Supervisor

Signature …….

Name: ……..

Designation with Stamp…….

Member of Supervisory Committee

Signature …….

Name: ……..

Designation with Stamp…….

Head of Department

Signature with Stamp……

Academic Coordinator

Signature with Stamp……

Abstract

Introduction:

Study was conducted at Combined Military Hospital, Lahore. In which sample size was 375 out of 6000 populations within duration of one month of Gynaecology and Paediatric OPD. It is found that majority of the respondents are from army background as the hospital is located at Lahore Cantonment Board's Territory and visitors are normally the army personnel and their immediate family members or servants.

Objective:

Assessment Of Maternal Behavior Regarding Supplementation (Folic Acid) Usage During Pregnancy

Background:

In Pakistan a study conducted in 2009 revealed that only 49% of women use folic acid in pregnancy while only 38% % of women are aware of use of folic acids in pregnancy. In most cases women didn't know what is the safe range of folic acid dose do they need to be used. They don't know the minimum/maximum boundaries regarding their health. In 2017 another research is conducted in Karachi, Pakistan in which data of 170 married women are analyzed and it is found only 54% women known about importance of this vitamin in pregnancy and only 30% women give correct answer about deficiency of this vitamin lead to neural tube defect or congenital disease. The purpose to conduct this research was the assessment of knowledge of pregnant women about the folic acids

Results:

It is observed that 76% of the respondents are having urban living as their social background while only 24% are from rural social living. A clear majority of the respondents are recurrent patients while about 11% of the total sample identified as new visitors. There is clear age group which is found to have visited the hospital with pregnancies in Gynaecology ward or after pregnancies with their kids at Paediatrics ward, nearly 77% of the respondents were of 28-47 age category. About 95% of the mothers were happily married while just over 5% were either divorced/separated or widowed. Academic qualification of the respondents has outclassed the figures as nearly 84% of the respondents fall under higher education category, this is the main reason behind the updated knowledge of folic acid among the respondents of CMH visitors.

Conclusion:

It is interpreted from Chi Square findings that the respondents with higher academic qualification have greater chance of having compact knowledge about food supplementation due to having more awareness of such health related information. The respondents with higher age group have greater chance of having compact knowledge about food supplementation due to having more awareness of such health related information.

TABLE OF CONTENTS

CHAPTER #1

INTRODUCTION

PREFACE OF THE CHAPTER

In this chapter, description of the study and introduction to food supplementation during pregnancy and its knowledge & awareness in mothers with reference to intake of Folic Acid and brief note of the researches studies on prenatal and perinatal healthcare with context to Pakistan will be discussed. This chapter will cover the statement of the problem, significance of the study, the knowledge gap, research questions and objectives of the study as well.

1.1 BACKGROUND OF THE STUDY

Folic Acid is a commercially manufactured type of a Vitamin B nutrient called folate. Folate assumes a significant function in the creation of red platelets and enables child's neural cylinder to form into their mind and spinal string. The best food wellsprings of folic acid are braced oats. Folate is discovered normally in dull green vegetables and citrus natural products.

A potential connection between obvious folate inadequacy and expanded frequency of rashness was proposed as ahead of schedule as 1944 by Callender. This was later affirmed by Gatenby and Lillie, and in 1960s, Richard Smithells and Elizabeth Hibbard guessed that the under sustenance or disabled folate status could be a significant factor in the root of NTD dependent on huge perceptions, that ladies who had brought forth the kids with birth surrenders for example anencephaly and pinnatifida have a modified formiminoglutamic acid contrasted with the female to unaffected kids.

Characterizing the phrasing is critical to any conversation of the part of folate in sustenance and conceptive science. The term folate is commonly utilized as a conventional name for the gathering of synthetically related mixes dependent on the folic corrosive structure. Folate, or nutrient B9, is considered as one of the 13 fundamental nutrients. It can't be blended once more by the body, and should be acquired either from diet or supplementation. Dietary folate is a normally happening supplement found in nourishments, for example, verdant green vegetables, vegetables, egg yolk, liver, and citrus natural product.

Folic Acid is a manufactured dietary enhancement that is available in falsely advanced nourishments and drug nutrients. Neither folate nor folic corrosive is metabolically dynamic. Both must be decreased to take an interest in cell digestion. l-5-Methyl tetrahydrofolate (l-methylfolate) is the dominating micronutrient type of folate that flows in plasma and that is engaged with biologic cycles (James A Greenberg M. S.-h., 2011)

To test this speculation Smithells and his gathering led an intercession preliminary with supplementation of a multivitamin containing diet with FA 0.36 mg/day during the periconceptional period to the partaking ladies who recently had newborn children with NTD. Interestingly, ladies who were at that point pregnant without nutrient supplementation were considered as controls. In the1980's, they distributed the aftereffects of this multi-focus intercession study that uncovered around 83-91% decrease in NTD repeat in enhanced ladies contrasted with that of un-enhanced ladies.

These outcomes initially featured that multivitamin or FA supplementation may assume a huge part in incubation and may diminish the repeat of NTD. Later in 1991, after a randomized control preliminary (RCT) led at 33 focuses in seven nations, the British Medical Research Council recommended, for ladies with a past history of NTD-influenced - pregnancies, the everyday supplementation of 400 micrograms of FA is powerful in forestalling the repeat of NTDs by 70%.

This was additionally upheld by the consequences of a - RCT directed in Hungary in 1992 that announced an everyday admission of 0.8 mg of FA during the periconceptional period fundamentally diminished the rate of a first event of NTD. In 1991, the CDC suggested an everyday admission of 4000 μg of FA previously and all through the time of pregnancy for ladies with earlier history of NTD-influenced pregnancy.

Later in 1998, in light of the proof and suggestion from the more extensive clinical network, the U.S. General Health Service and Food and Drug Administration suggested obligatory strongholds of FA in flour and grains to forestall NTD and birth absconds. In 2007, the Canadian proposals likewise included weight (BMI >35) as a wellbeing hazard, and suggested "the higher portion FA system (5 mg)" in patients with a background marked by helpless consistence with meds and extra way of life issues of variable eating routine, no predictable contraception, liquor, tobacco, and recreational

non-doctor prescribed medications use. Besides, to forestall the event of NTDs in epileptic and diabetic moms the suggestion is to take a higher portion of FA, 4–5 mg/day. (Subit Barua, 2014)

To turn out to be metabolically dynamic, folic corrosive should initially be changed over to dihydro folate (DHF) and afterward tetrahydro folate (THF) through enzymatic decrease, a cycle catalyzed by the chemical DHF reductase (DHFR). From that point, THF can be changed over to the naturally dynamic l-methyl folate by the compound methyl enetetrahydro folate reductase (MTHFR)

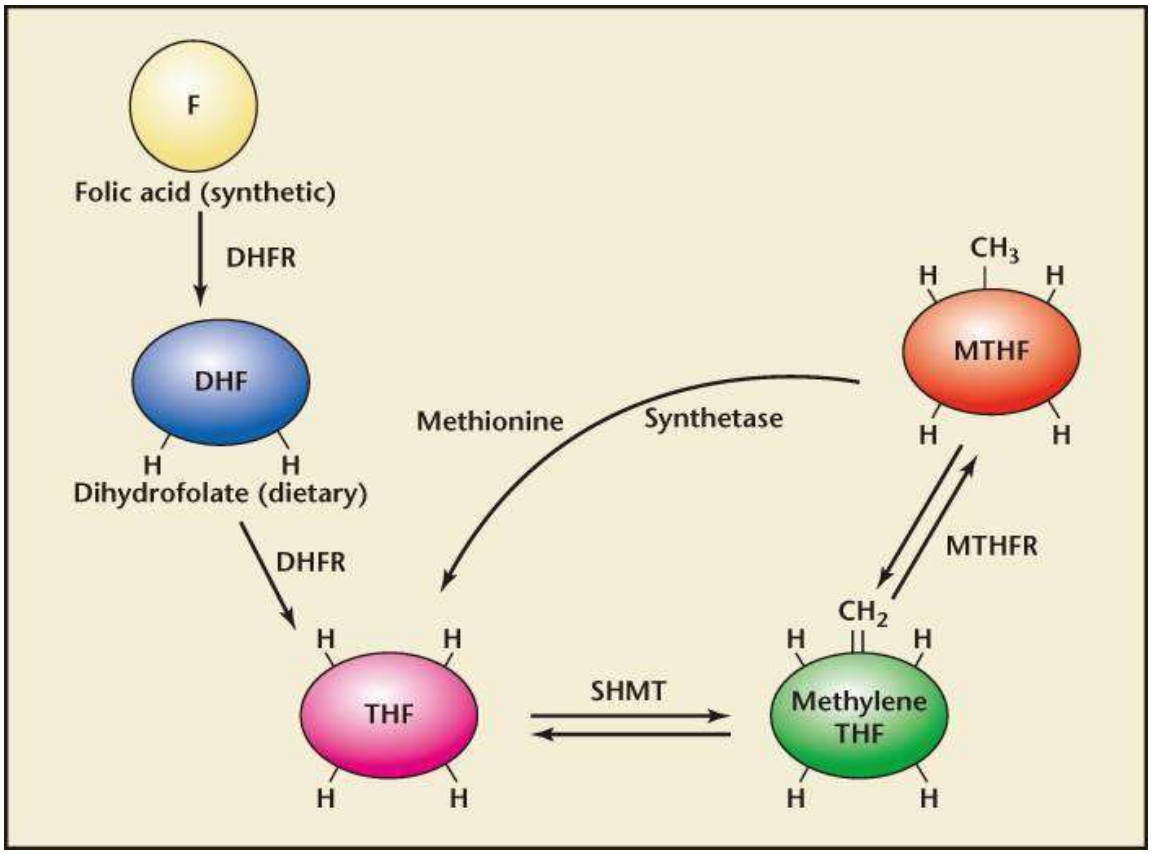


Figure 1.1 (Formation of l-methylfolate from folic acid) (SM, 2008)

This key transformation is important to give l-methyl folate to the one-carbon move responses (methyl gifts) required for purine/pyrimidine blend during DNA and RNA get together, for DNA methylation, and to control homocysteine digestion (Figure 2). MTHFR is the basic catalyst for practically all biologic cycles that include the digestion of folate and methionine.

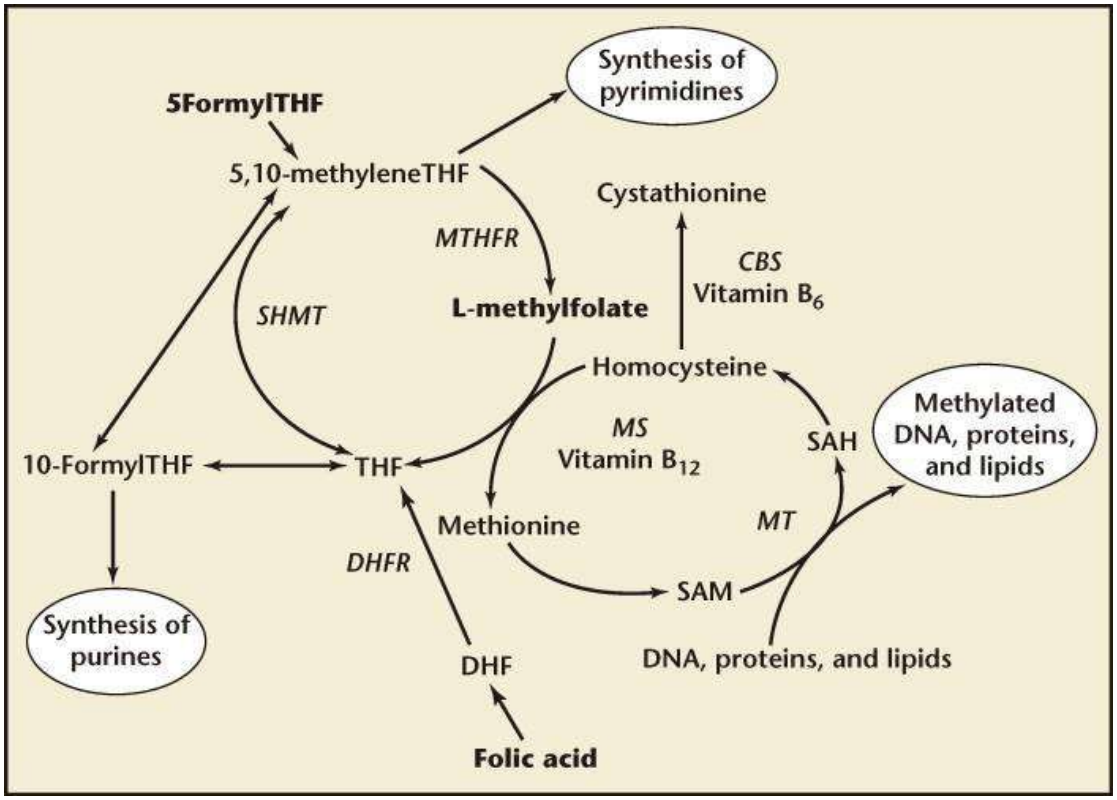


Figure 1.2 (Folate metabolic pathway)

Folic corrosive is a kind of B nutrient that is typically found in nourishments, for example, dried beans, peas, lentils, oranges, entire wheat items, liver, asparagus, beets, broccoli, Brussels fledglings, and spinach. Folic corrosive enables your body to deliver and keep up new cells, and furthermore forestalls changes to DNA that may prompt malignant growth. (Sophia Entringer, 2019). Folate happens normally in food, and folic corrosive is the manufactured type of this nutrient. Since 1998, folic corrosive has been added to cold oats, flour, breads, pasta, pastry kitchen things, treats, and saltines, as needed by government law. Nourishments that are normally high in folate incorporate verdant vegetables, (for example, spinach, broccoli, and lettuce), okra, asparagus, organic products, (for example, bananas, melons, and lemons) beans, yeast, mushrooms, meat, (for example, hamburger liver and kidney), squeezed orange, and tomato juice. (Fan C, 2017)

Pregnancy happens when a sperm treats an egg after it's delivered from the ovary during ovulation. The prepared egg at that point goes down into the uterus, where implantation happens. An effective implantation brings about pregnancy. By and large, a full-term pregnancy endures 40 weeks. (Kristeen Cherney, 2016). Folic corrosive is a pregnancy superhuman! Taking a pre-birth nutrient with the suggested 400 micrograms (mcg) of

folic corrosive previously and during pregnancy can help forestall birth deformities of your child's mind and spinal string. Take it consistently and feel free to have a bowl of braced grain, as well. (Traci C. Johnson, 2018)

During early turn of events, folic corrosive helps structure the neural cylinder. Folic corrosive is significant in light of the fact that it can help forestall some significant birth deformities of the child's mind (anencephaly) and spine (spina bifida). Ladies who are pregnant or attempting to become pregnant ought to get at any rate 400 micrograms (0.4 milligrams) of folic corrosive day by day before origination and for at any rate 3 months a while later. Studies show that this incredibly lessens a child's danger of genuine neural cylinder surrenders. Neural cylinder absconds are birth abandons that include deficient improvement of the cerebrum and spinal string. The most widely recognized neural cylinder deserts are:

- Spina bifida: when the spinal line and spinal segment don't totally close
- Anencephaly: a serious underdevelopment of the cerebrum
- Encephalocele: when cerebrum tissue projects out to the skin through an opening in the skull

These imperfections occur during the initial 28 days of pregnancy — as a rule before a lady even knows she's pregnant. That is the reason it's so significant for all ladies of childbearing age to get enough folic corrosive — not simply the individuals who are attempting to get pregnant. A big part of all pregnancies are not arranged, so any lady who could become pregnant should ensure she gets enough folic corrosive. It's not satisfactory why folic corrosive has quite a significant impact on the counteraction of neural cylinder absconds. Yet, specialists do realize that it's indispensable to the improvement of DNA. Accordingly, folic corrosive assumes a huge part in cell development and advancement, just as tissue arrangement. (Armando Fuentes, 5)

Probably the most recent examination uncovers the accompanying about folic corrosive insufficiency: There might be a connection between raised homocysteine (a marker for an expanded danger for arteriosclerosis) and folate lack. A bringing down of the danger of stroke however not unfavorable heart occasion when hyper-homo-cysteinemia is revised with folic corrosive Reduction in the occurrence of neural cylinder deserts with folic corrosive supplementation during pregnancy. Absence of folic corrosive during

pregnancy may build the danger of diabetes-related inherent incapacities and chemical imbalance. Maternal folic corrosive during pregnancy may bring down the danger of youth leukemia. Folic corrosive supplementation may build the danger of malignant growth. (Khan and Jialal, 2020)

This was a forthcoming birth accomplice study directed in ladies who had taken FA in the main trimester of pregnancy. Discoveries demonstrated that proceeding with FA supplementation at a portion of 400 µg/day in the second and third trimesters fundamentally expanded the danger of LGA (Large for gestational age) in Chinese ladies, and this connection was solid or monotonic even subsequent to changing for known important confounders. As far as anyone is concerned, this is the principal study announcing that proceeded with FA supplementation after the twelfth seven day stretch of pregnancy altogether expands the danger of LGA. Our outcomes uphold the theory that proceeded with supplementation with FA after the principal trimester is related with higher birth weight, length, head perimeter, and chest boundary. Nonetheless, it didn't essentially diminish the danger of SGA. (Sufang Wang, 2016)

Proceeded with supplementation with 400 µg FA/d in trimesters 2 and 3 of pregnancy can expand maternal and rope blood folate status and forestall the expansion in homocysteine focus that in any case happens in late pregnancy. Regardless of whether these impacts have benefits for pregnancy results or youth requires extra investigation. (Breige McNulty, 2013)

Proceeded folic corrosive supplementation in pregnancy past the early period prescribed to forestall NTD may effectsly affect kid psychological turn of events. Further randomized preliminaries in pregnancy with development in youth are justified. (Helene McNulty, 2019)

1.2 IMPORTANCE OF FOLIC ACID

Number of observational investigations have inspected the predominance of raised complete homocysteine in ladies with abruptio placentae, intrauterine development limitation, intermittent pregnancy misfortune, unconstrained fetus removal, and conveyance of low-birthweight newborn child. As a rule, the proof supporting a causal relationship is feeble and conflicting, because of methodological fluctuation and to lacking factual force due to the low number of cases in these generally uncommon conditions.

Nonetheless, Vollset et al. analysed relationship between current plasma complete homocysteine in a populace of 5,883 ladies and unfriendly results in pregnancies as long as 25 years sooner. Shockingly, toxemia, rashness, and low birthweights were completely connected with higher absolute homocysteine in later years, yet abruptio placentae was most certainly not. In a large number of these investigations, blood nutrient levels were not estimated, however where changes in nutrient status were noted, low folate instead of low nutrient B12 was involved in these problems.

Nonetheless, in one ongoing report from India, plasma folate, nutrient B12, and complete homocysteine were estimated at 28 weeks of development in 30 moms who proceeded to convey little for-gestational-age youngsters and 50 control moms. Higher plasma absolute homocysteine was essentially connected with lower birthweight ($p = .05$), and the creators proposed a connection with low pregnancy nutrient B12 instead of folate. (Molloy, 2008)

It's suggested that all ladies who could get pregnant should take an everyday supplement of 400 micrograms of folic corrosive before they're pregnant and during the initial 12 weeks of pregnancy, when the child's spine is creating. On the off chance that you didn't take folic corrosive enhancements prior to getting pregnant, you should begin accepting them when you discover you're pregnant. You can get them from drug stores, enormous markets, wellbeing food stores, or on remedy from a GP.

Since the mid-1990s, maternal folic corrosive supplementation has been prescribed preceding and during the principal trimester of pregnancy, to lessen the danger of new-born child neural cylinder abandons. Moreover, numerous nations have additionally executed the folic corrosive stronghold of staple nourishments, to advance adequate admissions among ladies of a childbearing age, in view of concerns encompassing variable dietary and supplementation rehearses. The same number of ladies keep on taking folic corrosive enhancements past the suggested first trimester, there has been a general expansion in folate admissions, especially in nations with compulsory fortress.

This has brought up issues on the ramifications for the creating embryo, given that folic corrosive, a methyl contributor, can possibly epigenetically adjust quality articulation. In creature contemplates, folic corrosive has been appeared to advance an unfavourably susceptible aggregate in the posterity, through changes in DNA methylation. Human populace considers have additionally depicted relationship between folate status in

pregnancy and the danger of ensuing youth hypersensitive illness. In this audit, we address whether or not continuous maternal folic corrosive supplementation after neural cylinder conclusion, could be adding to the ascent in early life unfavourably susceptible infections. (Catrina L. McStay, 2017)

The U.S. Food and Drug Administration (FDA) requires food-creators to add folic corrosive to their improved grain items. So you can support your admission by having breakfast grains, breads, pastas, and rice that have 100% of the suggested every day folic corrosive remittance. Check the item's mark for this data.

However, for most ladies, eating braced nourishments isn't sufficient. To arrive at the suggested every day level, you'll most likely need a nutrient enhancement. During pregnancy, you need a greater amount of the entirety of the basic supplements than you did before you got pregnant. Pre-birth nutrients shouldn't supplant an even eating regimen. Be that as it may, taking them can give your body — and your infant — an additional increase in nutrients and minerals. Some medical services suppliers suggest taking a folic corrosive enhancement notwithstanding a pre-birth nutrient. Converse with your primary care physician about your everyday folic corrosive admission. The person in question may suggest a remedy supplement, an over-the-counter brand, or both. Additionally converse with your primary care physician in the event that you've just had a pregnancy that was influenced by a neural cylinder imperfection or on the off chance that you or your accomplice were influenced by one yourselves. The specialist may suggest that you take a higher portion of folic corrosive (even prior to getting pregnant). (Armando Fuentes, 5)

In Pakistan newborn child death rate is 64 for every 1000 live births and the most well-known reason is rashness, 860,000 untimely births are recorded every year in Pakistan. In Asian area, tragically Pakistan has an expanding measurement with 748,100 preterm birth every year and has fourth most elevated number after India, China and Nige-ria. In spite of this, not many investigations are as of now accessible on Pakistani populace in such manner. As the commonness of preterm birth is shifting going from 11.411 to 22.8% on nearby populace and Pakistan is marked at fourth situation regarding preterm birth with predominance of 15.8%. (Hanif, (2017))

As this audit recommended, while prior examinations demonstrated defensive impact of folic corrosive on diminished danger of PE, some ongoing investigations neglected

to discover such an impact. The issue in ongoing examinations were that no supplementation was uncommon (under 5% in latest investigations) so determination inclination/bewildering gets hard to control. That is the reason a RCT is expected to figure things out. Another issue from concentrates by Bodnar et al. [15] and Catov et al. [17] was that they found a helpful impact of folic corrosive in lean ladies or typical weight ladies as it were. We accept that this is brought about by a portion issue: in the Bodnar and Catov concentrates most ladies had supplementation of 0.4 mg every day, and we proposed a portion of 4 mg every day in our FACT preliminary. On account of the possible hereditary and metabolic imperfections, ladies with expanded danger may require a higher portion.

An ongoing report by Keating et al. discovered that folate take-up was diminished by amphetamine, atenolol, ethanol, bliss, glucose, labetalol, nicotine, and tetrahydrocannabinol [24]. Besides, a considerable lot of these medications/substances were cytotoxic, and they differentially regulated the mRNA articulation of folate placental vehicle frameworks. In our introduction to the world companion study, we noticed a portion reaction relationship in high danger ladies. (Shi Wu Wen, 2013)

In Pakistan country zones are more presented to the lack of folic acids during pregnancy which is prompting more perplexing issues to both particularly mother. As indicated by an examination investigation of folic acids directed in Pakistan 51% of ladies are pallid in pregnancy yet just 44% of ladies utilize antenatal iron-folic corrosive (IFA) supplements. Little data exits on the observation and boundaries to the utilization of IFA supplements during pregnancy in Pakistan. Most of ladies knew about the apparent advantages of antenatal FA supplements. Be that as it may, the provincial ladies had more restricted data about the advantages of FA supplements than the metropolitan ladies.

The encouraging variables for the ladies' utilization of enhancements were: they known about advantages; they had trust in the medical services suppliers; the enhancements were accessible; they had the monetary ability to get them; they felt better in the wake of taking these enhancements; and they got uphold from relatives. The boundaries to the ladies' utilization of enhancements were: they neglected to take them; the non-accessibility of enhancements; their restricted monetary ability to get them; the absence of antenatal consideration administrations; relatives not permitting utilization of the

enhancements; not thinking about the advantages or no instruction; dread or experience of results; thinking about them as contraceptives; and felt better along these lines halted. (Yasir Bin Nisar, 2014).

1.3 MATERNAL MORTALITY IN PAKISTAN

Maternal micronutrient insufficiencies are broad in Pakistan and are possibly connected with maternal under sustenance and intrauterine development hindrance. Mediation systems to a great extent comprise of organization of iron-folic corrosive enhancements during pregnancy. (Bhutta, 2009)

As per a World Health Organization (WHO) audit of broadly delegate reviews from 1993 to 2005, 42% of pregnant ladies have weakness around the world. Practically 90% of pallid ladies live in Africa or Asia. Most nations have strategies and projects for pre-birth iron-folic corrosive supplementation. Iron-insufficiency pallor underlies 115,000 maternal deaths for every year around the world.

In Asia, sickliness is the second most noteworthy reason for maternal mortality. Indeed, even gentle and moderate pallor increment the danger of death in pregnant ladies. Iron-folic corrosive supplementation of pregnant ladies expands haemoglobin by 1.17 g/dL in created nations and 1.13 g/dL in non-industrial nations. The pervasiveness of maternal weakness can be decreased by 33% to one-half longer than 10 years if move is made to dispatch zeroed in, huge scope programs that depend on exercises gained from nations with effective projects, for example, Thailand and Nicaragua. (Sanghvi TG, 2010)

An aggregate report tells that the vast majority of the ones who utilized IFA tablets during pregnancy announced better wellbeing and actual strength in the wake of taking them. Ladies saw that IFA expanded blood volume, prompting fetal sustenance and made up for blood misfortune during conveyance. Notwithstanding, a socially educated apparent boundary was the conviction that IFA supplementation will build hatchling size, prompting birth confusions, hospitalization, cesarean segment and monetary weight for the family.

Network wellbeing labourers (CHWs) of BRAC (a non-government association) were the fundamental wellsprings of IFA data and enhancements, despite the fact that information on IFA tablets among ladies' interpersonal organizations additionally

assisted with making it satisfactory. Pregnant ladies felt that they could begin taking IFA during the main trimester of pregnancy whenever exhorted by the CHWs. Modified administrators and medical care suppliers communicated worry about beginning IFA supplementation early. (Ashraful Alam, 2015).

1.4 AWARENESS AND KNOWLEDGE OF FOLIC ACID

Study shows from 1988 to 2002, 16,555 ladies were analysed and Awareness of folic corrosive advantages expanded from 0 of every 1988 to half in 1996 and from that point. The utilization of folic corrosive in the periconceptional period expanded from 15% in 1988 to 40% over the most recent couple of years. Maternal instruction was a solid free indicator of both mindfulness and use as were nationality, regardless of whether the pregnancy was needed, family pay, and whether a medical services supplier was counselled prior to arranging. (Creator joins open overlay panelLolkje T.W.de Jong-van cave BergPharmD, 2005).

Another examination shows From 1994 to 2006 and 2007, information about the function of folic corrosive expanded from 25% to 77% and information that folic corrosive should be taken in the periconceptional period expanded from 12% to 39% The extent of pregnant ladies who expanded their periconceptional admission of folate rose from 61% in 1998 to 81% in 2006 and 2007, with huge expansions in the utilization of invigorated grains (from 15% to 29%) and folic corrosive tablets (from 37% to 64%). (Annabelle C Chan DPH, 2008)

During pregnancy, ladies may encounter a wide assortment of inconvenience, which is regularly not a detached issue but rather an entire scope of incorporated issues, with one here and there sustaining another (Davis, 1996). Ongoing very much controlled human examinations demonstrate that pregnant ladies with high pressure and nervousness levels are at expanded danger of antagonistic perinatal results (Mulder et al., 2002). During presentation to a pressure circumstance, the entire pressure directing framework is enacted, causing different hormones including the corticotropin-delivering hormone (CRH), adrenocorticotropin-delivering hormone (ACTH), cortisol, and noradrenaline to be delivered into the flow. Pregnant ladies react contrastingly to indistinguishable distressing improvements relying upon their past encounters, hereditary components, social help, or character qualities (Narendran, Nagarathna, Narendran, Gunasheera, and Nagendra, 2005).

For the primigravid ladies as the pregnancy advances, actual changes related with uneasiness with respect to work and fetal results or stresses over changes in their own life because of the pregnancy and labor possibly exacerbate the pressure reaction and lead pregnant ladies to have more noteworthy inconvenience (Huizink, Mulder, Robles de Medina, Visser, and Buitelaar, 2004).

An aggregate report tells that a large portion of the ones who utilized IFA tablets during pregnancy announced better wellbeing and actual strength in the wake of taking them. Ladies saw that IFA expanded blood volume, prompting fetal sustenance and made up for blood misfortune during conveyance. In any case, a socially educated apparent obstruction was the conviction that IFA supplementation will expand embryo size, prompting birth intricacies, hospitalization, caesarean area and monetary weight for the family (Ashraful Alam, 2015).

1.5 THE STATEMENT OF THE PROBLEM

This study is about knowledge and awareness of food supplement like Folic Acid in mothers at Combined Military Hospital (CMH) Lahore, which is run & operated by Pakistan Army, and known as one of the most well managed hospital in Pakistan. The visitors of this hospital are normally the in service and retired army personnel and their families. This research is aimed to gauge the degree of awareness of Folic Acid among the mothers of CMH, where the mostly visitors are pretty aware about the basics of personal healthcare. Normally, the studies are conducted in such settings where the respondents are from poorly managed government health facilities, having low or no awareness about the fundamental health indications and intakes. The results of those studies may not be aligned and promising with the elite institutions like CMH. On the other hand, it is quite challenging to get the permission for conducting research and data collection in an armed forces facility. Hence, the current research study will be unfolding the of the exclusive research insights about the knowledge and information of food supplements intake during pregnancies among patients of CMH.

1.6 RESEARCH QUESTIONS

The focus of this study is primarily on assessment maternal behaviour towards knowledge and awareness of Folic Acid during pregnancy. This research addresses the following questions.

- Is there any association between professional affiliation of respondents and awareness of folic acid?
- Is there any significant association between social background of respondents and awareness of folic acid?
- Is there any significant relationship between knowledge of Folic Acid usage and academic qualification of the respondents?
- Is the age of the respondents have positive connection on effective consumption of Folic Acid during pregnancy?

1.7 AIMS & OBJECTIVES OF THE RESEARCH

The focus of this study is primarily on assessment maternal behaviour towards knowledge and awareness of Folic Acid during pregnancy. The key aims and objective of this study is:

"Assessment of maternal behavior regarding supplementation (folic acid) usage during pregnancy"

1.8 SIGNIFICANCE OF THE STUDY

An Assessment Evaluation perform double assignments, first is that it serves to distinguish whether the project has any critical positive effect on maternal awareness; furthermore, this assessment offer crucial data about the imminent research areas that could fill the gap of previous studies of similar nature.

Notwithstanding this effect assessment give grounds to contributors and government whether to advance the current project or not (Snodgrass and Sebstad 2002). Nonetheless, amongst the Academic Development Community there is acknowledgment that maybe we know less about the effect of these projects than may be normal given the excitement for these exercises in contributor and arrangement making circles (Kurmanalieva et al., 2003).

The purpose of conducting this study is to observe proper usage of folic acid during pregnancy and observing how usage of folic acid decreases fetal anomalies and complication. This study is conducted at a prestigious health facility of Armed forces of Pakistan; where there is a great need to assess the general awareness level of the services offered by it to patients. This study can help the healthcare providers in policy making as well as understanding of the needs of the clients/patients of the sector in real terms.

SUMMARY OF THE CHAPTER

This chapter has helped to view of importance & usage of Folic Acid and its related terms which are commonly used with context to discussion of food supplementation and maternal health. It has also enabled to conceptualize the need, aim and significance of the study. Next chapter will uncover the previous work in this domain.

CHAPTER #2

REVIEW OF THE LITERATURE

PREFACE OF THE CHAPTER

The previous chapter has enabled the front line overview of the maternal Folic Acid intake and insights of the present research while this chapter will uncover the research work in the context of present study. At first, the need for assessment of knowledge and awareness of maternal food supplementation as well as the brief note of the previous studies about importance of Folic Acid will be discussed.

2.1 THEORETICAL UNDERPINNINGS

Maternal folic corrosive supplementation has been prescribed preceding and during the principal trimester of pregnancy, to lessen the danger of baby neural cylinder deserts. Likewise, numerous nations have additionally actualized the folic corrosive stronghold of staple nourishments, to advance adequate admissions among ladies of a childbearing age, in view of concerns encompassing variable dietary and supplementation rehearses. The same number of ladies keep on taking folic corrosive enhancements past the suggested first trimester, there has been a general expansion in folate admissions, especially in nations with compulsory fortress.

A led information disposition and practice of folic corrosive utilization in pregnant ladies. Out of 200 polls, 170 were returned appropriately filled. It demonstrated that 54% of the ladies knew about the significance of folic corrosive in pregnancy while just 29% thought about the complexities of folic corrosive inadequacy in the creating embryo. The outcomes uncovered sufficient utilization in 18% of the populace, 42% inadequate utilization while 40% didn't burned-through any wellspring of folic corrosive. Dietary admission of folic corrosive was completed simply by half of the chose ladies. 42.9% ladies had wrong act of devouring folic corrosive during pregnancy. There is by all accounts no critical relationship between the age and information on members just as education and work on with respect to folic corrosive utilization. (Sidra, 2017).

An examination directed shows a sum of 250 pregnant ladies were welcome to partake in the investigation at the two communities and all acknowledged. Their ages went from

13 to 45 years, with a mean of 25.9 years. Among the multipara, 120 ladies (65.93%) had gotten remedies for nutrients. Among the patients who had gotten remedies, 21 ladies (80.77%) said that they had utilized calcium and 88 ladies (73.33%) said that they had utilized folic corrosive. (Camila Atallah Pontes da Silva, 2010)

This study conducted to demonstrate folic acid awareness and use and to examine the association between folic acid supplementation and blood folate concentrations among early pregnant women in an area with high NTD levels in northern China. From December 2002 to February 2004, 693 first pregnant women were recruited and folic acid awareness, information and use were interviewed. Four milliliters of dangerous blood were drawn and blood pressure was measured. Folic acid awareness levels, knowledge and consumption among Chinese women living in a high NTD prevalence area during early pregnancy were very low and folate deficiency was quite prevalent. Campaigns aimed at raising awareness, awareness, and practical use of folic acid should target less educated women and women living in rural areas. (Aiguo Ren, 2006)

Masking of severe anemia (B12 deficiency) was a concern during folic acid supplementation, but the diagnosis of this condition should be based on B12 levels and not hemoglobin levels. The growth of cancer and open cancer was clearly another potential outcome, but as research shows that there is no increased risk associated with folic acid. Several indicators have been suggested to identify folate deficiency: Erythrocyte folate: It is related to tissue stores and provides information on a long-term but not recent condition. A cut limit of 305 nmol / L (140 ng / ml) was suggested, as studies have shown that all patients with megaloblastic anemia have lower values. Plasma homocysteine: Elevated levels are found in folate deficiency and are considered a critical indicator of folate status. According to a study by NHANES II, folic acid intake in the non-pregnant state is 207 μg / day which exceeds the limit of 180 μg / day, while 90% of pregnant women eat below the 400 μg / day limit. The Institute of Medicine (IOM) recommends that 400 μg of folic acid daily be obtained from a strong diet, vitamin supplementation or both are required during pregnancy to reduce the risk of NTD by 50%. (Savvas Argyridis, 2019)

In this cross-sectional study, homocysteine was administered to 155 normal women in the first, second, and third trimesters and in nonpregnant controls. In addition, albumin, serum B12, serum folate, and red cell folate concentrations were measured with

homocysteine values. The mean concentration of homocysteine (in micromoles per liter) was 5.6 (95% confidence interval 3.9–7.3) at 8–16, 4.3 weeks (95% interval confidence 3.5–5.3) during the 20-week gestation period. -28, 5.5 (95% confidence interval 3.3–7.5) at 36–42 weeks' gestation, and 7.9 (95% confidence interval 6.2–9.6) in the non-pregnant control group. Homocysteine was significantly lower in all 3 trimesters of pregnancy compared to non-pregnant controls (P <.001). Homocysteine levels are directly related to albumin levels, which decrease during pregnancy. Homocysteine concentration was reduced in studies taking folic acid supplementation. Serum concentration of homocysteine decreases during pregnancy. This occurs in conjunction with a fall from albumin during pregnancy, as well as folic acid supplementation. (Mark C.Walker, 1999)

The addition of folic acid in the periconceptual period is known to reduce the risk of neural tube defects. The addition of a higher dose prevents a higher number of recurring errors, while lower values reduce the risk of first occurrence. The Department of Health advises all women considering pregnancy to take folate supplements 12 weeks before pregnancy and in the first trimester of pregnancy. A British study shows that taking this advice is bad. The purpose of the current study was to assess counseling in the Northampton women's group between January and June 2001. There are 301 Caucasus women and 301 employed in antenatal clinic. The women were between the ages of 16 and 42 and completed a list of questions related to healthy eating supplements before and during pregnancy and a five-day food diary, which was used to measure food intake. The data support the evidence that neural tube defects are more likely to be prevented by basic dietary reinforcement than supplementation, but underscore the fact that young women from poor social communities may still need close employment and support. (S C Langley-Evans, 2002)

Same examination) in Australia has led from 1994 to 2006 and 2007, information about the part of folic corrosive expanded from 25% to 77% ($P < 0.001$) and information that folic corrosive should be taken in the periconceptional period expanded from 12% to 39% ($P < 0.001$). The extent of pregnant ladies who expanded their periconceptional admission of folate rose from 61% in 1998 to 81% in 2006 and 2007 ($P < 0.001$), with huge expansions in the utilization of invigorated grains (from 15% to 29%) and folic corrosive tablets (from 37% to 64%). The complete commonness of NTDs tumbled

from 2.06 per 1000 births in 1986–1990 to 1.23 per 1000 births in 2002–2007 (relative danger, 0.60; 95% CI, 0.48–0.74; P < 0.001). (Annabelle C Chan DPH, 2008)

This has brought up issues on the ramifications for the creating hatchling, given that folic corrosive, a methyl benefactor, can possibly epigenetically change quality articulation. In creature contemplates, folic corrosive has been appeared to advance a hypersensitive aggregate in the posterity, through changes in DNA methylation. Human populace contemplates have additionally depicted relationship between folate status in pregnancy and the danger of resulting youth unfavourably susceptible illness. In this survey, we address whether or not continuous maternal folic corrosive supplementation after neural cylinder conclusion, could be adding to the ascent in early life hypersensitive sicknesses. (Catrina L. McStay, 2017)

An end dependent on his exploration with respect to folic jumble in guardians. His discoveries recommend that supplemental FA taken during the main month of pregnancy might lessen, however not dispose of, the expanded danger of ASD related with maternal pesticide introduction previously and during pregnancy. Bigger examinations, presentation estimations or markers that are tentatively gathered, and exploration on potential systems would be useful in pushing the field ahead. (Rebecca J. Schmidt, 2017)

Destitute folate status amid pregnancy can lead to lifted maternal plasma levels of homocysteine (Hcy) with related pregnancy complications and unfavorable neonatal results, proposing placental digestion system of Hcy could be an imperative determinant in impacting fetal advancement. The metabolic pathways for Hcy in placenta are not well characterized. In this think about we inspected the quality expression of key chemicals included in Hcy digestion system in to begin with trimester and term human placenta to decide which metabolic pathways win. Expression of mRNA for methionine synthase and 5,10-methylene tetrahydrofolate reductase, proteins included within the methionine cycle and mindful for the re-methylation of Hcy to methionine, were communicated at comparative levels between to begin with trimester and term and in comparison to human liver as positive control. In differentiate, cystathionine β-synthase mRNA expression was extraordinarily lower than that in liver at both gestational periods. Betaine–homocysteine methyl transferase mRNA. (N.Solanky, 2010)

An add up to of 57 and 23 articles were included for the predominance and BW sub-reviews, separately. The pooled gauges of vitamin B-12 inadequate were 21%, 19%, and 29% within the to begin with, moment, and third trimesters, separately, with tall rates for the Indian subcontinent and the Eastern Mediterranean. The expansive heterogeneity between thinks about was mostly tended to by making a standardized score for each ponder (cruel vitamin B-12 inadequate ÷ cutoff esteem), which inside redressed for geographic locale, trimester, and test sort. Twelve of the 13 longitudinal considers included appeared a diminish in cruel or middle vitamin B-12 over trimesters. Pooled investigation appeared non significantly lower maternal vitamin B-12 concentrations in LBW than in normal-BW newborn children and higher chances of LBW with lower vitamin B-12 values (balanced OR: 1.70; 95% CI: 1.16, 2.50), but considers from India generally contributed to the latter. Their audit demonstrates that vitamin B-12 inadequate amid pregnancy is common indeed in non-vegetarian populaces which concentrations of vitamin B-12 decrease from the primary to the third trimester. There's no steady affiliation between vitamin B-12 inadequate and LBW. In any case, given the long-term dangers of LBW, this perception warrants advance cohort thinks about and randomized controlled trials. (Nithya Sukumar, 2016)

An aggregate report tells that the greater part of the ones who utilized IFA tablets during pregnancy announced better wellbeing and actual strength in the wake of taking them. Ladies saw that IFA expanded blood volume, prompting fetal sustenance and made up for blood misfortune during conveyance. Nonetheless, a socially educated apparent obstruction was the conviction that IFA supplementation will expand hatchling size, prompting birth confusions, hospitalization, caesarean segment and monetary weight for the family. Network wellbeing labourers (CHWs) of BRAC (a non-government association) were the principle wellsprings of IFA data and enhancements, despite the fact that information on IFA tablets among ladies' interpersonal organizations additionally assisted with making it worthy. Pregnant ladies felt that they could begin taking IFA during the principal trimester of pregnancy whenever exhorted by the CHWs. Modified supervisors and medical care suppliers communicated worry about beginning IFA supplementation early. (Ashraful Alam, 2015)

Populace based imminent associate estimations closed maternal plasma folate fixations at roughly 13 weeks of development (90 % range 10.5–17.2) and surveyed folic corrosive supplementation. I n unadjusted models, fetal head development was 0.006

SD (95 % CI 0.003; 0.009, P < 0.001) quicker every week per 1-SD higher maternal folate focus. After change for confounders, this affiliation was constricted to 0.004 SD every week (95 % CI 0.000; 0.007, P = 0.02; assessed total contrast upon entering the world of 2.7 mm). The affiliation was autonomous of generally fetal development. No affiliations were found between maternal folate focuses and youngster postnatal head development. Preconceptional beginning of folic corrosive supplementation was related with bigger pre-birth head size, however not with pre-birth or postnatal head development. (Jolien Steenweg-de Graaff, 2017).

Folate (nutrient B9) is a fundamental supplement that is needed for DNA replication and as a substrate for a scope of enzymatic responses associated with amino corrosive blend and nutrient digestion. Requests for folate increment during pregnancy since it is additionally needed for development and advancement of the hatchling. Folate insufficiency has been related with variations from the norm in the two moms (weakness, fringe neuropathy) and hatchlings (inborn anomalies).

Dietary supplementation with folic corrosive around the hour of origination has for quite some time been known to lessen the danger of neural cylinder deserts (NTDs) in the offspring.1–4 This article audits the digestion of folic corrosive, the fitting utilization of folic corrosive supplementation in pregnancy, and the likely advantages of folic corrosive, just as the conceivable supplementation of l-methylfolate for the counteraction of pregnancy-related confusions other than NTD. (James A Greenberg M.S.H., 2011)

2.2 COMPLICATION DUE TO DEFICIENCY OF FOLIC ACID

A defensive impact of folate against the improvement of neural cylinder surrenders (NTDs), explicitly, anencephaly and spina bifida, is currently very much perceived, having been set up by a chain of clinical examination concentrates over the past 50 years. This article sums up the more significant of these investigations, which have prompted the current circumstance in which all ladies fit for turning out to be pregnant are encouraged to ingest folic corrosive routinely. The suggested admissions are 4 mg/d for those at high danger (by temperance of a past NTD pregnancy result) and 0.4 mg/d for all others.

Be that as it may, a decrease in NTD births didn't follow declaration of these suggestions, thus folic corrosive stronghold was ordered in the United States and some different nations. Albeit some contention stays about the sufficiency of stronghold levels, the cycle was trailed by critical improvement in folate lists and a decrease of 25–30% in NTD recurrence (around one-portion of the extent of cases thought to be receptive to folate). The folate-NTD connection speaks to the main occasion where an inborn contortion can be forestalled basically and reliably.

All things considered, a few exploration holes remain: distinguishing proof of the component by which the imperfection happens and how folate improves it; portrayal of the general viability of food folate, folic corrosive added to nourishments, and folic corrosive without anyone else; outline of the portion reaction relations of folate and NTD avoidance; and more exact measurement of the portion expected to forestall repeats. A connection among folate and neural cylinder surrenders (NTDs), first proposed a little >50 y back (1), has gotten perceived because of an enormous number of clinical examinations. Examination around there has gotten a lot of consideration for a few reasons.

In any case, the overall significance of inborn mutations when all is said in done has expanded as other significant reasons for fetal and newborn child horribleness and mortality (eg, preterm birth, contaminations) have gone under control. Besides, NTDs are normal (the most widely recognized mutations of the focal sensory system and presumably second just to cardiovascular deformities among major intrinsic peculiarities) and they speak to a significant general medical condition by goodness of their mortality, dreariness, social expense, and human torment. At last, and maybe in particular, it presently being evident that maternal folic corrosive supplementation forestalls a generous extent of NTDs, we have distinguished unexpectedly a circumstance in which an innate imperfection is obviously amiable to preventive measures. (Pitkin, 2007)

In 1998, first time, a relatively-representative test of pregnant and lactating ladies was considered, and the predominance rate of press insufficiency was 18.7%. Consequent thinks about among 196 lactating ladies from urban ghetto communities of Addis Ababa, the capital city of the nation, appeared a predominance of 22.3%, suggesting the issue to extend in its size and coming to to a level of moderate public-health

significance. As such, this think about could be a exceptionally imperative step forward to profit of evidence-based data on the size of frailty and compare the components mindful for weakness among weak and non-anaemic ladies to recognize the potential causes of weakness in apparently-healthy Ethiopian ladies. Out of the 27,000 ladies enlisted, as it were 22,861 (86.7%) were considered for the clinical evaluation for the discovery of folic animea due to deficiency of vitamin B12. To distinguish the potential determinants of frailty, as it were those (n=970; 84.8%) who had total hematological and the critical parameters are displayed within the ensuing segments. To see the impact of parasitic invasion by sorts of weakness, chi-square test was run. Interests, the event of all sorts of frailty was lower among ladies who had no parasites, proposing that intestinal parasite within the display think about was less likely to be the causative specialist. women who had low haemoglobin and normal ferritin values were considered as having anaemia from causes other than iron deficiency, such as deficiencies of folic acid and vitamin A and B112, (Jemal Haider, 2010)

The affiliations between the normal impalpable of folate, vitamin B6, and vitamin B12 from nourishments and supplements calculated from the 1980, 1984, 1986, and 1990 nourishment recurrence surveys and hazard of breast cancer in this settled case–control populace were comparative to affiliations gotten for plasma gauges of each supplement. Among ladies expending at slightest 15 g/day of liquor, the multivariable RRs of breast cancer comparing the most elevated four quintiles with the most reduced quintile of the normal immaterial from nourishments and supplements were 0.78, 0.12, 0.19, and 0.11 (95% CI = 0.02 to 0.71 for most elevated versus most reduced quintile) for folate; 0.20, 0.21, 0.30, and 0.16 (95% CI = 0.03 to 0.91 for most elevated versus least quintile) for vitamin B6; and 1.18, 1.06, 2.16, and 0.25 (95% CI = 0.05 to 1.20 for most elevated versus most reduced quintile) for vitamin B12. In this prospective, nested case–control study, higher plasma folate levels were associated with lower risk of female breast cancer. The inverse association between plasma folate levels and risk of breast cancer was particularly strong and statistically significant among women who consumed moderate amounts of alcohol (≥15 g/day). (Shumin M. Zhang, 2003)

During a populous study out of the 502 educated women, 97.5% did not have a complete diet at the first visit, however, 98.2% were taking folic acid (FA) supplementation. Only 1.8% (n = 9) had anemia on their first visit (excluding macrocytosis). Subsequently, 212 women had another Hb sample in the third trimester

and 8.5% (n = 18) had anemic and 43.4% (89/205) had anemic postnatally. There was a correlation between the development of postpartum anemia and RBC folate levels at the first visit (P = 0.02). In a country where the strengthening of the FA diet remains voluntary, these findings support the recommendation that women should start FA support before pregnancy and continue with FA after the first trimester. (E G O'Malley, 2018)

The clinical use of FA supplementation / intake to prevent NTDs has been well documented over the past 20-25 years (Additional file 1: Table S1). However if you look at concerns about the level of post-consolidation stress in people, it is interesting to examine whether exposure to FA in key parts of humans has an impact on other common biological processes, such as brain development (Figure 2). Determining the extent and distribution of the methylation profile of the epigenome of the brain may reveal the mechanism and sub-effects of various neuropsychiatric disorders and prognosis involving autism. And since the level of the human condition can influence methylation, in the future more studies are needed to test system differences in the DNA methylation profile in terms of time and volume between different people and between sexes. Studies and careful monitoring of the effects of FA diet on global methods will help physicians determine appropriate treatment strategies and best prevention strategies to improve general public health, in addition to accurately differentiating these vitamin supplements from diet, supplementation and supplementation. (Mohammed A Junaid, 2014)

A research based study about the use of folic acids tells the figures that how much FA is important. Of the approximately 119 pairs of mothers and children, 70 children completed the test by age 7, and 39 by 3 years. At age 7, children of mothers treated with folic acid received significantly higher scores than the placebo group in word processing: mean 13.3 (95% CI 12.4-14.2) compared to 11.9 (95% CI 11.0-12.8); p = 0.027; at 3 years, they scored the highest points in comprehension: 10.3 (95% CI 9.3-11.3) compared to 9.5 (95% CI 8.8-10.2); p = 0.040. In both time points, the greater number of children from mothers treated with folic acid compared with placebo had higher levels of cognitive levels of between 10 (girls and boys) of Bayley's Scale of Infant and Toddler Development (BSITD), and 24.5 (girls) and 21.5 (boys) of Wechsler Preschool and Primary Scale of Intelligence (WPPSI) Test. Compared with a nationally representative sample of 7-year-old British children, WPPSI test scores were higher in

children from mothers treated with folic acid with oral IQ ($p < 0.001$), performance IQ ($p = 0.035$), general language ($p = 0.002$), and total IQ ($p = 0.001$), whereas comparisons of the placebo group with British children showed small differences in verbal IQ scores ($p = 0.034$) and total IQ ($p = 0.017$) and no differences in performance -IQ or standard language. (Helene McNulty, 2019)

Subar et. al examined representative data from the second National Health and Nutrition Examination Survey (NHANES II) and found that the dietary intake of the women tested (207 ± 2.9 μg / d) was equivalent to the recommended dietary (RDA) of non-pregnant state (180 μg / d). About 90% of women have consumed <400 μg folate / d (RDA pregnancy) and only ≈10% of women have met the RDA of pregnancy. More blacks (26%) than white women (18%) had very low folate (≤100 μg / d), which is probably the lowest calorie count reported in a few women (175-185 μg / d). Apart from this, there was little or no national difference when the daily intake of food exceeded 100 μg / d. The negative effects of pregnancy are two to three times higher in children born to poor urban women from countries such as the United States. Other factors that may affect the outcome of pregnancy include inadequate pregnancy, inadequate maternity care, smoking, drinking, and drug abuse. A history of spontaneous abortion, premature delivery, low birth weight, or intrauterine growth limitations in previous pregnancies may increase the risk of current pregnancy. A diet low in micronutrients and folate-like vitamins can also increase the risk of adverse pregnancy outcomes. (Theresa O Scholl, 2000)

Between April 2011 and November 2015, 6499 pregnant women were screened and 2464 of these women were registered in the case, 1228 of whom underwent folic acid treatment and 1236 went for placebo. After a miscarriage of women (n = 37), they experienced early intrauterine infant mortality (20-24 weeks of pregnancy, n = 12). The prevalence of primary symptoms and pregnancy was similar between the two groups. More than 80% of pregnant women in both groups reported taking folic acid or folic acid-containing vitamins. Of the 1941 women (78.8%) who returned the bottles for the study treatment, 1465 (75.5%) took at least 75% of their pills, ensuring a high level of compliance. A total of 2738 infants were born of women who were recruited (1364 in the folic acid group and 1374 in the placebo group). The birth rate of the deceased was 1.1% in the folic acid group and 1.9% in the placebo group (0.60, 0.30 to1.19; table 3).

No statistically significant differences were observed in the adverse birth outcomes between the two groups. (Shi Wu Wen, 2018)

Folic acid supplementation increased from 11.8% in the two months before pregnancy to 46.9% in the 3rd month of pregnancy, but decreased to 26.0% in the first month of pregnancy. Of the 16 116 women (71.6%) who took folic acid supplements sometime before or during pregnancy, 72.4% started using them after pregnancy. Ten percent of women used supplements regularly from 1 mo before pregnancy throughout the first trimester. These women often report on higher education for mothers and fathers, planned pregnancies, birth control treatments, or chronic illnesses. They were more likely to be old, married, and non-smokers with higher incomes and lower equality. Most women start taking folic acid too late in relation to the prevention of neural tube defects. Effective interventions to improve folic acid intake are necessary and should take into account both human and economic factors. (Roy M Nilsen, 2006)

It is known that folic acid supplementation during pregnancy is associated with a much lower risk of having a baby with NTDs, 2 independent clinical trials in 2002/03 have shown that supplementing a woman's diet with folic acid before and during previous pregnancies has reduced the risk of NTDs. at 70%. The results showed that among those who did not know that a person's diet was important during pregnancy, 46.6% reported less accurate information. Also, about one-third of women who correctly described the role of folate in pregnancy were aware of folate-rich foods and 28.3% of them indicated a healthy diet. In Poland, 42.2% of women can identify folate-rich foods. Similarly, 29.5% of women in the study reported that the best time for extra labor should be before pregnancy. In Norway 0.4% of the number of educated people means that the first period for the addition of NTDs block papers is before or at the beginning in pregnancy, while in the United States 7% of women interviewed knew that they should take folate during pregnancy. (H. Al-Hossani, 2010)

Thise study was conducted on a sample of women from various economic sectors of the developing world. There was a very high number of employees, only 23% had university degrees and 75% booked antenatal care in the second or third trimester of pregnancy. Within this cohort, there is a low prevalence of FA use during pre-screening. The level of awareness, and usage, however, is similar to what was reported from other low-level resource settings such as awareness of 5% of Nepali women's support time.

The introduction of the Periconceptional FA is more likely to be seen in women in higher economic levels, those with university degrees and who have booked in advance for antenatal care. Awareness of the role of the FA in preventing birth defects during periconception was equally important in these groups of women. A similar behavior was reported among Dutch women, in a study in which those with higher levels of education regardless of nationality were able to use FA periconception. It is also possible for women in higher levels of socio-economic status or better education to have greater access to information. They are thus more empowered, and more likely to behave in a healthier way. Pregnancy planning is important because women usually realize their pregnancy about three weeks after conception, when FA support may be too late to prevent neural tube defects. In conclusion, the FA entry into Nigeria is very bad for mothers in general and is very important for those in the working class, those who are less educated, more powerful or who have left the ANC. The same female groups are less likely to know the role of the FA in preventing birth defects. (Taiwo Akeem Lawal, 2014)

Women who were intended to become pregnant were more likely to take visible folic acid than unintended pregnant women. The importance of fertile women taking daily multivitamins containing 400 μg (0.4 mg) of folic acid should be emphasized for women who are not thinking about pregnancy, especially young and low-income women. a month before the pregnancy, and 39.9% said their pregnancy was unintended. Young mothers were less likely to drink folic acid (9.2%) and were more likely to report unintended pregnancies (62.0%) than older women. (Kenneth D. Rosenberg, 2003)

Mothers of children affected by the neural tube defect had very low levels of B12. In all 3 groups those in the lowest B12 quartiles, compared to the highest ones, had between two or three times the number of contraindications for motherhood of a child affected by neural tube defect. Concentration of B12 pregnancy concentrations of <250 ng / L is associated with significantly higher risks. Deficiency or maternal vitamin B12 deficiency is associated with an increased risk of neural tube defects. We recommend that women have vitamin B12 levels of> 300 ng / L (221 pmol / L) before pregnancy. Improving B12 status beyond this level may reduce further risk reduction, but this is not sure if vitamin B12 is available. (Anne M. Molloy, 2009)

The fetus, the newborn, and the pregnant woman are in dire need of folic acid and vitamin B12 and are more likely to suffer from a deficiency of these vitamins. This article reviews the source, requirement, absorption, and physiology of these vitamins and discusses problems caused by their deficiency in pregnancy and childbirth. (MajidShojaniaM.D., 1994)

Plasma concentrations of unmodified FA from additional FA at a dose of 400 μg / d, in addition to the FA from fortified foods, were low or unavailable to mothers and newborns. Maternal benefits and interest rates for further FA supplementation beyond the first trimester of pregnancy can be achieved without the risk of increasing the unregulated FA circulation, even for those already exposed to the FA by a strictly defensive diet. Statistical analysis was performed using the Statistical Package of Social Sciences (SPSS.) Software. Details in plasma concentrations of folate forms were modified by log before analysis for general purposes. With continuous variability, differences between groups were assessed using an independent trial. Food intake was tested during the second trimester using a 4-d food diary in conjunction with the most common food questionnaires, the latter focusing specifically on the use of FA-containing foods. This diet was previously developed by us and confirmed by the discovery of B and related vitamins as described in detail elsewhere. The FA usually has a strong immune system, it seems to have little effect on the concentration of FA in the mother's body or blood vessels even though it improves the condition of mothers and newborns. In the event that adverse effects of implanted FA in the body are confirmed, this study suggests that exposure to pregnant women at 400 μg FA / d will have a small effect. (Kristina Pentieva, 2016)

While the relationship between folate and NTD is well established, folate deficiency may be related to other serious birth defects. A randomized controlled trial of periconception folic acid containing multivitamin supplementation showed a decrease in urinary tract and paralysis of the cardiovascular system. The occurrence of facial cracks, cracks in the mouth and right palate can be reduced with a large dose of folic acid. This blocking effect can be the result of other actions. One researcher suggested that the root cords were not related to compensation for ineffective mitosis caused by a lack of humanity. A large CDC study showing protection against NTDs by folic acid also analyzed other birth defects. Preliminary data suggest that periconceptional folic

acid protects against all major cerebral palsy, vascular cell dysfunction, paralysis, omphalocele and cleft lip and / or right palate. (Green, 2002)

An advance research in the same field shows that out of the 292 women in the vicinity, 211 (70%) provided information on supplement use. Of these, 67 (31%) reported taking folic acid supplements as recommended; 118 (56%) only during pregnancy [22 (18%) only occasionally]; and 26 (12%) did not drink folic acid at all. Eight focus group discussions were held by 24 participants. Negotiations have shown that there is a valid reason behind current recommendations. Participants often linked folic acid use to morning sickness, and used active lifestyles, prioritized competition for anxiety, and poor memory in calculating occasional use. Building on the 'evidence base' from their experience, many cited the results of a healthy pregnancy without further use and expressed doubts about its protective action. The findings of the present study highlight the importance of guidance on the importance of daily use of folic acid, the severity of neural tube defects and the provision of evidence on risk reduction. (Anderson, 2011)

Researchers Compared with children unexposed to AEDs and folic acid. Congenital abnormalities detected at termination of pregnancy, at birth or until 3 months of age according to CBZ, PB, PHT, or PRI exposure at 5–12 weeks from first day of the last menstrual period (LMP), stratified by folic acid supplementation. the odds ratio of congenital abnormalities was 1.47 (95% CI 1.13–1.90) in children exposed to AEDs without folic acid supplementation and 1.27 (95% CI 0.85–1.89) for children exposed to AEDs with folic acid supplementation. The results indicate that the risk of congenital abnormalities in children exposed in utero to CBZ, PB, PHT, and PRI is reduced but not eliminated by folic acid supplementation at 5–12 weeks from LMP. The statistical precision in our study is limited due to rarity of the exposures, and further studies are needed. (Olsen, 2008)

The results from a randomized controlled trial (RCT) provide strong evidence that multivitamins prevent congenital heart disease, but this RCT did not provide evidence that multivitamins prevent facial dissociation. In addition, many observational and intervention studies have not been performed to obtain an independent effect from folic acid. Early studies suggested that unintentional multivitamin use was associated with an increase in pregnancy and multiple births, leading to widespread controversy over the safety of folic acid use during pregnancy. We are also reviewing reports designed

to answer these questions in more detail. When more evidence is reported on the effect of periconceptional folic acid in the event of heart failure and birth defects, we will have additional support to promote folic acid intervention programs. All women who are able to conceive should continue to consume 400 μg / d of folic acid in addition to a healthy diet as recommended. (Lynn B Bailey, 2005)

Low folate may not be a significant risk factor for depression during pregnancy and postpartum depression, but it can be dangerous for depression without pregnancy, especially in women with methylenetetrahydrofolate reductase (MTHFR) C677T TT genotype. Since low folate status is affected by stress, a high folate diet, in the form of supplements, during pregnancy can provide protection from depression during pregnancy and after childbirth. We did not find strong evidence that folic acid supplementation reduced the risk of depression during pregnancy to 8 months after conception. However, we have found evidence that folic acid supplements during pregnancy are protected from stress at 21 months postpartum, and that this effect is more pronounced in those with the MTHFR C677T TT genotype (change in stress scores from 8 months to 9 months. -21 after childbirth among TT people was 0.66 (95% CI = 0.31-1.01) among those who did not take supplements, compared to − 1.02 (95% CI = -2.22-0.18) among those who took supplements at 18 weeks pregnant, P difference = 0.01). (S J Lewis, 2012)

Research conducted using a structured questionnaire. Descriptive statistics were presented, analyzed analyzes and deferred to compare subgroups. During pregnancy, 79% of women took folic acid, most of which started before 13 weeks. the acquisition of folic acid supplementation at the time of observation was significantly lower than that of all women planning a pregnancy consumed 0.4-0.5 mg of folate per day. Less than one-third of this sample was taken with a pre-pregnancy supplement folic acid, with variations found in the group. The vast majority of respondents also took a list of other vitamin supplements during pregnancy. (Della A.Forster, 2009)

Although there are public health campaigns around the world that recommend a significant daily supplement of synthetic folic acid to reduce the risk of neural tube defects, many women do not follow these recommendations. At the same time, in many European lands, no errors have been recorded in recent years. The most at-risk groups are those with low levels of education, young people, and unplanned pregnant women.

In addition, in many countries without compulsory supplementation, the population does not consume 0 · 4 mg of the recommended diet per day. Voluntary reinforcement improves the situation, but it does not reach all segments of the population. In the USA, Canada, and Chile, forced fortification has significantly improved folate and homocysteine levels, and neural tube defects have dropped by between 31% and 78%. However, many countries do not opt for mandatory folic acid enforcement, in part because additional health benefits have not been scientifically proven in clinical trials, in part because of terrible health risks, and because of the problem of free will. Therefore, additional mechanisms for creating public health need to be developed to prevent neural bone defects and to improve the condition of everyone. (Dr Monika Eichholzer, 2006)

The question of whether high concentrations of folate that occur in vital parts of the population after consolidation can be dangerous requires further research, as does the question of whether folic acid levels in the blood disrupt human-dependent metabolism. The studies reviewed above show that, in animals, many important biological processes depend on the response of methylation. In addition, dietary availability of methyl donors and / or dietary status may affect these processes. In addition, growing evidence points to the dangerous effects of the imbalance between folate and vitamin B-12, a potential for people who eat only vegetables, some small races, and the elderly with vitamin B-12 malabsorption. Stabilization was introduced specifically to protect NTDs, and we all believe that improved folate status obtained by increased folic acid intake influences the biological processes associated with neural tube. High blood folic acid intake may be associated with a decrease in natural cytotoxicity killer, and high folate status may reduce the response of anti-malarial drugs used for malaria, arthritis, psoriasis and cancer. In the elderly, a combination of high folate levels and low vitamin B-12 levels may be associated with an increased risk of dementia and anemia and, in pregnant women, an increased risk of insulin resistance and obesity in their children. (A David Smith, 2008)

A study uncovered that changed dietary proportions of folate and B12 can have more extreme impacts than the person lacks. The thinking about underpins the suggestion to preserve an adjustment of folate and B12 within the peri-conception period and amid pregnancy. Be that as it may, there are certain confinements to this ponder. Unexplained passing's of females encouraged with B12 deficient folate over-supplemented eat less

(BDFO) and barrenness watched within the same dietary gather warrants assist considers. We might not decide the estimate and weight of the pups (F2). Dietary fiber sources such as cellulose and pectin used in several dietary definitions lacking diets can lead to modifications within the microbiome which was moreover not surveyed within the show study. Materials and Strategy. (Aatish Mahajan, 2019)

Insufficient vitamin B12 status in a pregnant lady increments the chance for unfavorable maternal and fetal results. The utilize of serum vitamin B12 concentration alone to evaluate vitamin B12 status in pregnant ladies is questionable since of the diminish in serum vitamin B12 levels in typical pregnancy. A add up to of 143 ladies were selected within the consider. The ladies extended in age from 18 to 53 a long time. The larger part of the subjects were Hausa (n = 35), taken after by Berom (n = 1 8), Fulani (n = 1 2), Igbo (n = 9), and Yoruba (n = 7). The leftover portion (n = 61) detailed other ethnic assignments. Forty-three of the ladies detailed having less than six a long time of tutoring, 50 had more noteworthy than six a long time of school, and 48 had gone to college. The instructive foundation of two ladies was not accessible. Housewives accounted for the most elevated number of subjects (n = 38), taken after by tailors (n = 31), understudies (n = 17), dealers (n = 16), experts (n = 12), instructors, (n = 10), clerical workers (n = 1 0), and other occupations (n = 8). The lion's share of the ladies (n = 8 8, 61%) were within the moment trimester; 30 (21%) were within the to begin with trimester and 25 (17%) within the third trimester. Supplements were utilized by 11 ladies: 10 were taking press and folate supplements, while as it were 1 subject detailed taking a folate supplement as it were. Eight of the 11 ladies who were taking supplements had previous pregnancies. The cruel blood weight for all of the subjects was within the typical extend, but for one lady who had an raised blood weight (>140/>90 mmHg); she was assessed and treated by a doctor. (Dorothy J. VanderJagt, 2011)

Folic corrosive (FA) added to nourishments during fortress is 70-85% bioavailable contrasted with half of folate happening normally in food sources. In this way, if FA supplements likewise are taken during pregnancy, both mother and embryo can be presented to FA surpassing the Institute of Medicine's suggested mediocre maximum breaking point (TUL) of 1,000 micrograms for each day (μg/d) for grown-up pregnant ladies. The essential goal is to assess the extent of ladies taking folic corrosive (FA)

portions surpassing the TUL previously and during pregnancy, and to recognize corresponds of high FA use. (Cathrine Hoyo, 2011)

Folate (nutrient B) is a basic supplement that is needed for DNA replication and as a substrate for a scope of enzymatic responses associated with amino corrosive amalgamation and nutrient digestion. Requests for folate increment during pregnancy since it is likewise needed for development and improvement of the embryo. Folate inadequacy has been related with irregularities in the two moms (sickliness, fringe neuropathy) and hatchlings (innate anomalies). This article audits the digestion of folic corrosive, the suitable utilization of folic corrosive supplementation in pregnancy, and the expected advantages of folic corrosive, just as the conceivable supplementation of l-methyl folate for the anticipation of pregnancy-related confusions other than neural cylinder surrenders. (James A Greenberg, 2011) (Helene McNulty, Articles, 2019).

Asthma is one of the most widely recognized ongoing youth illnesses. While folic corrosive supplementation around origination forestalls neural cylinder abandons, a creature model recommends it very well might be a danger factor for respiratory sicknesses; albeit epidemiologic investigations have had clashing outcomes. We explored the circumstance of folic corrosive containing remedy filling during pregnancy and kid asthma. (Sreenivas P. Veeranki, 2015) (Schmidt, 2012)

Proceeded folic corrosive supplementation in pregnancy past the early period prescribed to forestall NTD may effectsly affect kid intellectual turn of events. Further randomized preliminaries in pregnancy with development in youth are justified. Periconceptional folic corrosive forestalls neural cylinder abandons (NTDs), yet it is questionable whether there are benefits for posterity neurodevelopment emerging from proceeded with maternal folic corrosive supplementation past the main trimester. We examined the impact of folic corrosive supplementation during trimesters 2 and 3 of pregnancy on psychological execution in the kid. (Helene McNulty, ffect of proceeded folic corrosive supplementation past the principal trimester of pregnancy on psychological execution in the kid: a subsequent report from a randomized controlled preliminary (FASSTT Offspring Trial), 2019)

A study conducted related to folate and newborn. Results shows that maternal age was 29.9 ± 4.4 y, 72% of the moms had ≥12 y of instruction, 49.5% were nulliparous, 93% were married/cohabitants, and 17% were day by day smokers. Utilize of folic corrosive-

and cobalamin-containing supplements was detailed at any time amid pregnancy by 51 and 53%, individually, though 41 and 38% detailed utilize ≥5 d/wk amid the 3rd trimester. Birth weight was 3673 ± 455 g. Based on our finding that folate and cobalamin status vary particularly concurring to bolstering category (10), we isolated 6-mo-old newborn children into 4 bunches: Ex BF, BF+S, BF+S+F, and NBF newborn children. Length of elite breast-feeding varied between bunches ($P < 0.001$) (Fig. 1). For folate status, there was a contrast between bunches, but as it were the BF+S+F bunch contrasted altogether from the Ex BF bunch. Cobalamin status was comparable within the 3 BF groups but uniquely diverse within the NBF newborn children. Advance investigations were in this manner kept to BF infants (age 188 ± 6 d, duration of exclusive breast-feeding, 135 ± 37 d). (Gry Hay, 2010)

Around 3,000 children are brought into the world with neural cylinder surrenders in the United States every year. Ordinarily, the neural cylinder forms into the spinal string and cerebrum by 28 days after origination. In the event that the neural cylinder doesn't close appropriately, neural cylinder surrenders happen. Anencephaly is a condition where the mind doesn't grow appropriately. Children brought into the world with anencephaly can't endure. Children brought into the world with spina bifida or encephalocele may confront different medical procedures, loss of motion, and long haul incapacity. As indicated by a 2015 audit of studies. Confided in Source, maternal folic corrosive supplementation fundamentally diminishes the danger of intrinsic heart deserts. These deformities happen in 8 out of each 1,000 births in the United States.

As indicated by the American Heart Association, inborn heart absconds happen when the heart or veins don't develop regularly before birth. They may affect the inside dividers of the heart, the heart valves, or the conduits and veins of the heart. Examination believed Source likewise shows folic corrosive supplementation in early pregnancy may help forestall congenital fissure and congenital fissure. These birth abandons happen if parts of the mouth and lip don't consolidate appropriately during the initial 6 to 10 weeks of pregnancy. At least one medical procedures are generally expected to address the situation. (McDermott, 2020)

2.3 FOLIC ACID FACTS FROM PAKISTAN

In Pakistan provincial territories are more presented to the inadequacy of folic acids during pregnancy which is prompting more intricate issues to both particularly mother.

As indicated by an exploration investigation of folic acids directed in Pakistan 51% of ladies are frail in pregnancy yet just 44% of ladies utilize antenatal iron-folic corrosive (IFA) supplements. Little data exits on the observation and boundaries to the utilization of IFA supplements during pregnancy in Pakistan. Most of ladies knew about the apparent advantages of antenatal FA supplements. (Bhutta, 2009)

Studies have indicated that offspring of moms with pre-birth folate inadequacy were at higher danger of enthusiastic issues (OR: 1.57; 95% CI: 1.03, 2.38) yet not conduct issues (OR: 1.00; 95% CI: 0.64, 1.56) after change for confounders. A higher danger of passionate issues was additionally found in kids whose moms began utilizing folic corrosive enhancements late or didn't utilize supplements by any means (OR: 1.45; 95% CI: 1.14, 1.84) than in kids whose moms began periconceptionally. Be that as it may, low plasma folate focuses just incompletely clarified this affiliation (OR: 1.38; 95% CI: 1.08, 1.78). Low maternal folate status during early pregnancy is related with a higher danger of passionate issues in the posterity. (Jolien Steenweg–de Graaff, 2012).

The middle age at determination was 10.5 months (3-24 months). All the newborn children were only breast encouraged and they displayed with serious nonspecific signs, such as shortcoming, disappointment to flourish, refusal to wean, spewing, formative delay, crabbiness and tremor in expansion to megaloblastic weakness. The determination was affirmed by total blood tallies, blood and marrow smears and serum vitamin B(12) and folic corrosive levels. The middle hemoglobin level was 6.4 g/dL (3.1-10.6) and cruel corpuscular volume (MCV) was 96.8 fL (73-112.3). A few patients too had thrombocytopenia and neutropenia. All the newborn children appeared clinical and hematological enhancement with vitamin B (12) organization. Patients with serious weakness causing heart disappointment gotten pressed ruddy blood cell transfusions as the beginning treatment. Pediatricians must consider wholesome vitamin B(12) lack due to maternal dietary lack within the differential conclusion of a few gastrointestinal, hematological, formative and neurological disarranges of newborn children with destitute financial status. Delay in determination may cause irreversible neurological damage. (E Zengin 1, 2009)

This study showed a high prevalence of folate deficiency and anemia among Senegalese women (15-49 years), particularly those living in rural settings and breastfeeding women. The cruel folate concentration was 8.50 nmol/L (8.16-8.85 nmol/L), and 54.8%

of the ladies were folate insufficient (<10 nmol/L). Plasma folate concentration of provincial ladies (7.27 nmol/L [6.89-7.68 nmol/L]) and urban ladies (10.45 nmol/L [9.88-11.05 nmol/L]) was altogether diverse (P < .0001), the most noteworthy concentration being watched in ladies living in Dakar, the capital of Senegal. The breastfeeding ladies appeared lower plasma folate concentration compared to nonbreastfeeding ones: 6.97 nmol/L (6.37-7.63 nmol/L) versus 9.03 nmol/L (8.61-9.46 nmol/L). In general, 27% of the ladies were enduring from inflammation/infections. Cruel Hb concentration was 116.86 (1.18) g/L, and 47.63% of the ladies included within the think about were iron deficient (pregnant ladies Hb <110 g/L; nonpregnant Hb <120 g/L). Too, a positive and critical relationship was found between plasma folate and Hb concentrations (r = .07; P = .0167). (Ndèye Fatou Ndiaye, 2017)

SUMMARY OF THE CHAPTER

The chapter has explored the key concerns and findings of the different studies in the domain of present research. Here, we've explored the global changes in public health strategies, aimed at improving folic acid status 25 years ago, and summarize the current available evidence for maternal folic coordination acid supplementation during pregnancy and the development of diseases caused by the fetus. This based on the demand for research literature investigating the folic acid relationship between mother's increase use in pregnancy, in the case of incontinence, and in the effects of childhood autoimmune diseases; once changes in folate- and folic-related public health strategies. PubMed Information, Medline, Cochrane Library, and Google Scholar have been searched, to find articles published before end of August 2016, using a combination of several of the following search terms: allergies, atopy, epigenetics, DNA methylation, folate, folic acid, maternal diet and pregnancy. Recent reference list Review articles and key lessons were also reviewed, identifying any other relevant subjects that were not available during initial data search. Many publications from other collections have been tested, for potential participants to meet and results. All relevant subjects are included in this review. This body of knowledge will be utilized to build the practical grounds for the study in order to formulate the basic research structure which will be discussed in next part.

CHAPTER #3

MATERIALS AND METHODS

PREFACE OF THE CHAPTER

The past two parts of the study have discussed about the current studies to set up a theoretical structure and to fabricate an establishment for the development of hypotheses. The main goal of this part is to propose theories in light of the past investigations of knowledge and awareness about food supplementation so as to figure out maternal behavior towards the use of folic acid. The second target is to establish a model to evaluate the association between food supplementation (Folic Acid) and age, education, affliation, and number miscarriages during pregnancies. Demographic variables, for example affliation, age, current marital status, education, number of miscarriages, chidren & adult family members, and category of respondent are taken for investigation purpose. A comprehensive research plan is also shared at the end of this chapter.

3.1 Material and Methods

Study Design

A cross sectional study design used to assess the effectiveness of health education on knowledge and practices pregnant women

Study Site:

The site of this study is Combined Military Hospital, Lahore

Study Duration:

Study was conducted in the time period of 6 months after approval of synopsis.

Study Population:

The study population for this research are pregnant ladies

Sample Size:

Study size is 375

Research Tool

Questionnaire was used. With the response of yes or no. Questionnaire was built by collection of different studies and little modification done according to study site. The study sites were (Sidra, 2017), (Bhutta, 2009), (Hanif, (2017)).

Sampling Technique

Simple Random sampling technique was used. The data was collected from mothers who were recently delivered and were admitted at that time.

The first step in designing a quantitative survey is to conceptualize the assessment chain to be examined. It should specify the units of analysis to be assessed and the types of assessment to be studied (Hulme, 1997). Although there has been abundant literature and research available on usage and significance of Folic Acid, but somehow practitioners have been experiencing the methodological flaws in the assessment studies since long. The most difficult issue in these studies has been to find out that whether the impact was due to food supplementation alone or there were certain other factors like maternal genetic and socio-economic backgrounds, which are highly significant to consider before drawing any authentic conclusion.

3.2 FORMULATION OF HYPOTHESES

Based on the literature review and establishing relationships among variables through logical reasoning in the theoretical framework, next step is to formulate the hypotheses and operationally define the variables. Purpose of operationalization is rendering the constructs measurable. This is done by looking at the dimensions which is then translated into observable and measurable elements. These hypotheses are established at household.

3.3 RESEARCH HYPOTHESES

H - I: Professional affliation of the respondents has a significant association with level of awareness and intake of Folic Acid during pregnancy period.

H - II: Social background of the respondents has a significant association with level of awareness and intake of Folic Acid

H - III: The knowledge of Folic Acid usage has been influenced by academic qualification of the respondents

H - IV: Age of the respondents have positive connection on effective consumption of Folic Acid during pregnancy.

3.4 STUDY POPULATION

The Combined Military Hospital (CMH) Lahore was marked as the study site, and OPD of its Gynecology and Paediatrics department was the research frame. It was observed that the weekly combined average OPD of Gynecology and Paediatrics department remained around 2000, and the survey period was of 3 weeks, hence the study population for this research were those estimated 6000 maternals of the stated department.

3.5 SAMPLING METHOD

The type of sampling method for a research based study is based availablility of data and resources like time, cost, security etc. As this research is a small scalled slef funded academic research with the very limited of the stated resources, it has been deemed most feasible to operate with Convenient Sampling method in collection of first hand data through a structured questionnaire at Combined Military Hospital (CMH) Lahore, an institution where the researcher is currently employed.

3.6 SAMPLE SIZE

There is a great debate about the appropriate sample size hence it majorly depends upon available resources. Here is the formula which is generally used for the computation of sample size of a finite population.

Yamane Formula for sample size computation

$$n = N / (1 + Ne^2)$$

n = Number of samples
N = Total population
e = Error tolerance

In present study the population size was 6000 whereas 5% error tolerance or level of significance assumed.

$$n=6000/[1+ (6000) (0.05) ^2]$$

=375 samples

Hence, a sample of 375 OPD maternals of gynecology and paediatrics department was taken for this study.

Inclusion criteria:

The subject who is included in the study are:

- Married women age above 18
- Pre or post-natal women
- Parents and willing pregnant women

Exclusion criteria:

The subjects who are excluded from the study were:

- Unmarried women
- Women are married but having fertility problems
- Unwilling parents and pregnant women

3.7 RESEARCH TOOL

A structured questionnaire is used to gather the first hand data through face to face interaction. Nominal scale questions has been placed before the respondents to gauge the responses. The questionnaire is adopted by collection of different studies like (Sidra, 2017), (Bhutta, 2009), (Hanif, (2017))

Questionnaire included inquiry on their demographic data, knowledge and use of folic acid. There were total 24 questions in the questionnaire including 8 demographic questions, all the questions are close-ended questions. Questionnaire was divided into 2 sections. Section A contains demographic data (Maternal background, education, age, family size). Section B contains knowledge of folic acid, use of folic acid, source of advice of folic acid and knowledge concerning food rich in folic acid.

3.8 DATA COLLECTION PROCEDURE

Face to face interview was done from maternals during their visit of hospital, each interview almost took 15-20 minutes. Women who were not educated and didn't know how to write, in this condition questionnaire were filled by myself, after verbalize each question and to get its response.

3.9 VARIABLES OF THE STUDY

Independent variable

- Academic Qualification
- Professional Affliation
- Social Background
- Age of the Respondent

Dependent variable

- Knowledge & awarenss of significance and accurate intake of food supplementation during prenatal and perinatal phase of pregnancy.

3.10 METHODS OF STATISTICIAL ANALYSIS

To perform statistical analysis of data, it is important to first understand variables and what should be measured using these variables. There are different levels of measurement in statistics and data can be broadly classified into qualitative and quantitative data. The level of measurement of a variable decides the statistical test type to be used. The mathematical nature of a variable or in other words, how a variable is measured is considered as the level of measurement.

NON PARAMETRIC TEST

To run a parametric test, we need to have sample of normally distributed populations and there is also an assumption of homogeneity of variance that variance within the groups are same. We also need to assume that level of measurement is interval or ordinal. So, if we unable to fulfil these conditions then there are several other non-parametric techniques for testing hypothesis. It is not required in non-parametric tests whether the data is normally distributed and samples are ordinal or nominal. Moreover, the non-parametric tests are less complicated and easy to analyse.

Additionally, the non-parametric tests are less confounded and simple to break down. Gamston (2006) suggests that chi square test is best to utilize when we have to focus the distinction between two groups. In this study, chi square is applied to compute the difference between established and new clients. Furthermore, chi square has been perfect with the studies conducted previously (Effa, Herring, 2005; Marr, 2002; Morris and Barnes, 2005; Schmidt et al., 2006).

CHI SQUARE TEST

The Chi Square test is the most generally utilized sort of non-parametric and exceptionally imperative in nature. Chi Square is applied when there is needed to test the difference between an actual sample and previously established distribution that is known as expected, which may be expected due probability or chance of happening. It can also be used to test differences between two or more actual samples.

We anticipate applying chi-square test of independence when there are two nominal variables, each with two or more possible values and there is a need to know whether the proportions for one variable are different among values of the other variable.

GOODNESS OF FIT TEST IN CHI-SQUARE

The chi-square goodness of fit test is suitable when the accompanying conditions are met:

- The technique for sampling is preferably random sample.
- The test ought to be expansive regarding populace under study.
- The absolute variable under study.
- The expected value of the quantity of sample observations in every level of the variable should not be less than 5.

The Chi Square comprises of four stages: A) Stating the hypotheses B) Formulation of an analysis plan C) Analyzing sample data D) Interpretation of the results.

FORMULA FOR COMPUTATION

$$\chi^2 = \sum \frac{(\text{Observed Value} - \text{Expected Value})^2}{(\text{Expected Value})}$$

The level of significance for analysis in the study is 5% or $p<0.05$ as it is mostly commonly used in studies of social science.

DATA ANALYSIS PROCEDURES

Chi square test is used for the comparison and association of maternal factors with preterm as well as term birth. Level of significance is 5% corresponding to 95% of confidence interval and results are showed as significant if P value (≤ 0.05). The statistical program SPSS version 22 was used for data entry and analysis.

After taking informed consent, data collected by the researcher with the questionnaire. Data will be collected according to the variables of the questionnaire which are as follows.

- Demographics data taken from the participants
- Question asked according to variables of the study

3.11 OPERATIONAL DEFINITIONS

Effectiveness

Effectiveness is the capability of producing a desired result or the ability to produce desired output. When something is deemed effective, it means it has an intended or expected outcome, or produces a deep, vivid impression. In the study effectiveness means the outcome of program regarding the importance and knowledge of right usage of folic acid.

Health Education

Health education is defined as any combination of learning experiences designed to facilitate pregnant women, health workers and nurses' voluntary. In this case it is referred to a voluntary program, which is designed to provide knowledge to pregnant women.

Knowledge

Knowledge means awareness, awareness is about developing an understanding of one's mental health needs and the potential to be vulnerable to further episodes of mental illness. In this study knowledge of participants regarding the usage and safe practicing of folate.

Practice

Practice is defined as to use an idea or actually put it into place. It also refers to the act of continually doing something in order to get better at it. In this case practice of participant regarding prevention of any disorder by telling them the importance and usage of folate.

ETHICAL CONCEDRATION

While collecting data and performing research following ethical consecration will be involved in the work.

- The subjects will be informed that there are no disadvantages or risk on the procedure of the study.
- Data will be kept in under key and lock while keeping keys in hand. In laptop it will be kept under password.
- Written informed consent attached will be taken from all the participants.
- All information and data collection will be kept confidential.
- Participants will remain anonymous throughout the study.
- They will also be informed that they will be free to withdraw at any time during the process of the study.

3.13 COMPREHENSIVEPLAN OF RESEARCH

	Week 1-4	Week 5-8	Week 9-12	Week 13-16	Week 17-20	Week 21-24
Research Planning	••					
Literature Review	••					
Research Methodology & Tools		••••				
Organizations Protocols management for Data Collection			••••			
Collection of Data through Questionnaire				••••		
Analysis of Data through SPSS & MS Excel					••••	
Finalization of Dissertation & Proof Reading						••
Final Review & Submission						••

SUMMARY OF THE CHAPTER

This particular part of the study has explored the research framework in which the formulation and validation of the hypotheses is presented. Moreover, the model and population of the study with sampling method and sampling size is also briefed. This will link to the next part of the study in which the results are discussed.

CHAPTER #4

RESULTS AND DISCUSSION

PREFACE OF THE CHAPTER

The preceding chapter has developed the structure and framework of the research and in this chapter, the analysis and discussions will be drawn on the basis of data collected through survey questionnaire. Hence, this chapter is most important part of the study to find out what the research work reveal at the end of the day. The chapter has to establish an evaluation to the general perception and information about maternal intake of Folic Acid. Demographic variables, for example, respondent's affiliation, type, social background category, age, academic qualification, number of children and adult family members will also be discussed with the demographic overview and chi square test which will be taken for analysis purpose.

4.1 RESPONSE RATE

Response rate in a research alludes to the quantity of individuals whom addressed the study divided by the quantity of individuals in the sample. It is normally communicated as a percentage (AAPOR, 2008). A response rate in a research is the result of isolating the quantity of respondents approached by the aggregate of the respondent in the sample whom were qualified and ought to have been interviewed. (Visser et al, 1996)

With the passage of time, response rate in a survey study was considered as a vital mainstay of the quality of research. Numerous scientists consider that higher rate of survey response guarantee more solid results (Aday 2011; Babbie 1990; Backstrom and Hursh 1963; Rea and Parker 1997). On the other hand, measuring the connection of non-response and survey exactness is a mind boggling and extravagant procedure. In any case, as of late, few all around organized studies have given some exact proof to view the impacts of lower response rates. Such studies have at last been set in recent times and numerous concludes that the expense of expanding the response rate typically is not clarified which gives the distinction in precision of the study.

In this study, a sample size of 375 visiting mothers of gynaecology and paediatrics department of CMH Lahore are taken. The questionnaire needed to design in such way that to save the time and effort of the respondents at a place like hospital, therefore a personally administered questionnaire formulated which has eventually significantly reduced the consumption of resources required to conduct a well versed survey based research.

Some of the respondents were not possible to be interviewed completely due some geographical restrictions as well as the security issues. While, some questionnaires were not in a condition to be utilize in the data entry process. Hence, face to face well-structured interviews conducted until a milestone of 375 valid and accurately filled questionnaires forms is achieved. It is observed at the end of the day that a total of 496 maternal visitors were interacted in order to get over the line of 375 valid responses, which summarises the response rate to 75.60%. These forms are preceded further for analysis and interpretation in terms of maternal awareness and knowledge regarding food supplementation during pregnancy.

4.2 SAMPLE DEMOGRAPHIC PROFILE

Sample demographic profile of the respondents helps to show that the maternal samples are the representatives of the entire population which is under study. Analysing the respondents on the basis of respondent's affiliation, type, social background category, age, academic qualification, number of children and adult family households highlights the linkage between general level of consciousness of maternal food supplementation as well as the backgrounds of such intake of Folic Acid. Demographic profiles are generally used for cross tabulation in data analysis in order to draw the better interpretations and confined results.

4.3 ANALYSIS OF DEMOGRAPHIC DATA

DESCRIPTIVE ANALYSIS

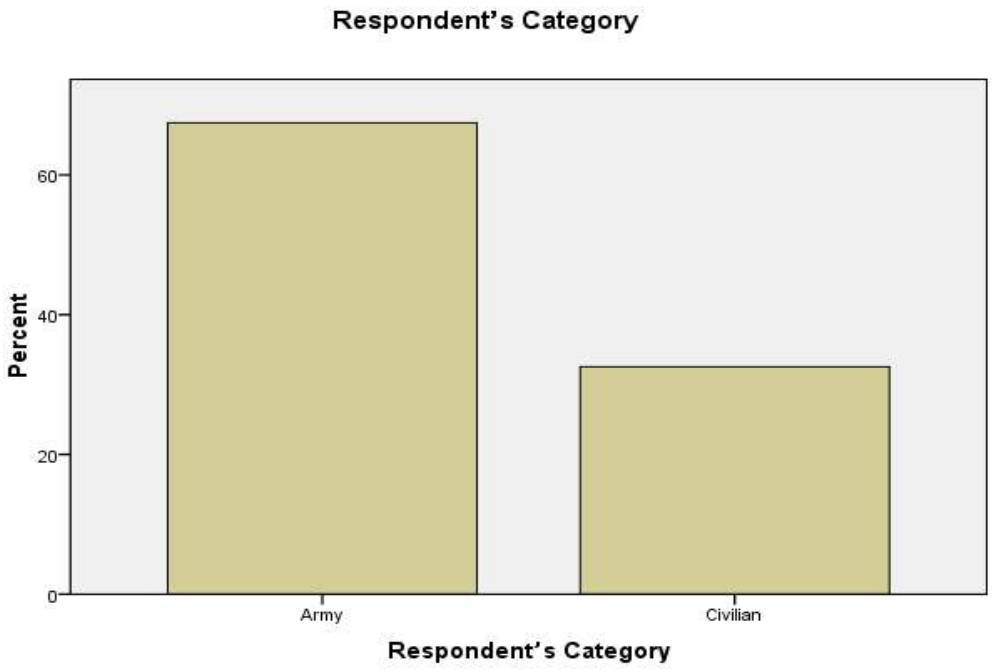
4.1-Respondents Affiliation Category

Table 4.1: Affiliation category of the Respondents

		Frequency	Percent	Valid Percent
Valid	Army	253	67.5	67.5
	Civilian	122	32.5	32.5
	Total	375	100.0	100.0

Source: Developed through field data

Figure 4.1: Affiliation category of the Respondents



Interpretation of Table 4.1 and Figure 4.1

Table and graph figure 4.1 shows that 253 out of 375 which accounts for 67.5% of the total respondents belong to army backgrounds and whereas 122 or 32.5% respondents are consisted of civilian background. As the study site i.e. CMH Lahore is located in cantonment area and run & operated by Pakistan Army so a vast majority of the visitors

belong to army ranks. Whereas personal servants of army officers and residents of nearby civilian populations do also reach this hospital for diagnosis and treatment.

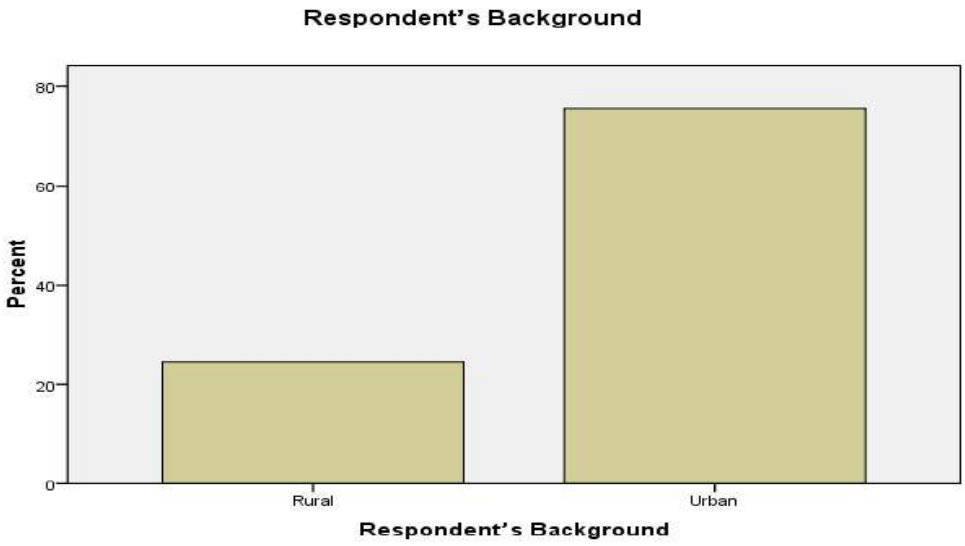
Table 4.2 Social Background of the Respondents

		Frequency	Percent	Valid Percent
Valid	New Patient	40	10.7	10.7
	Recurrent Patient	335	89.3	89.3
	Total	375	100.0	100.0

		Frequency	**Percent**	**Valid Percent**
Valid	Rural	92	24.5	24.5
	Urban	283	75.5	75.5
	Total	375	100.0	100.0

Source: Developed through field data

Figure 4.2 Social Background of the Respondents



Interpretation of Table 4.2 and Figure 4.2

Above table graph shows two types of respondents as from rural and urban background. Demographics shows that some of respondents that were living in urban

areas but actually they were from rural areas as native. There was high percentage of respondents from urban areas (n = 283) 75.5% and (n = 92%) 24.5%.

Source: Developed through field data

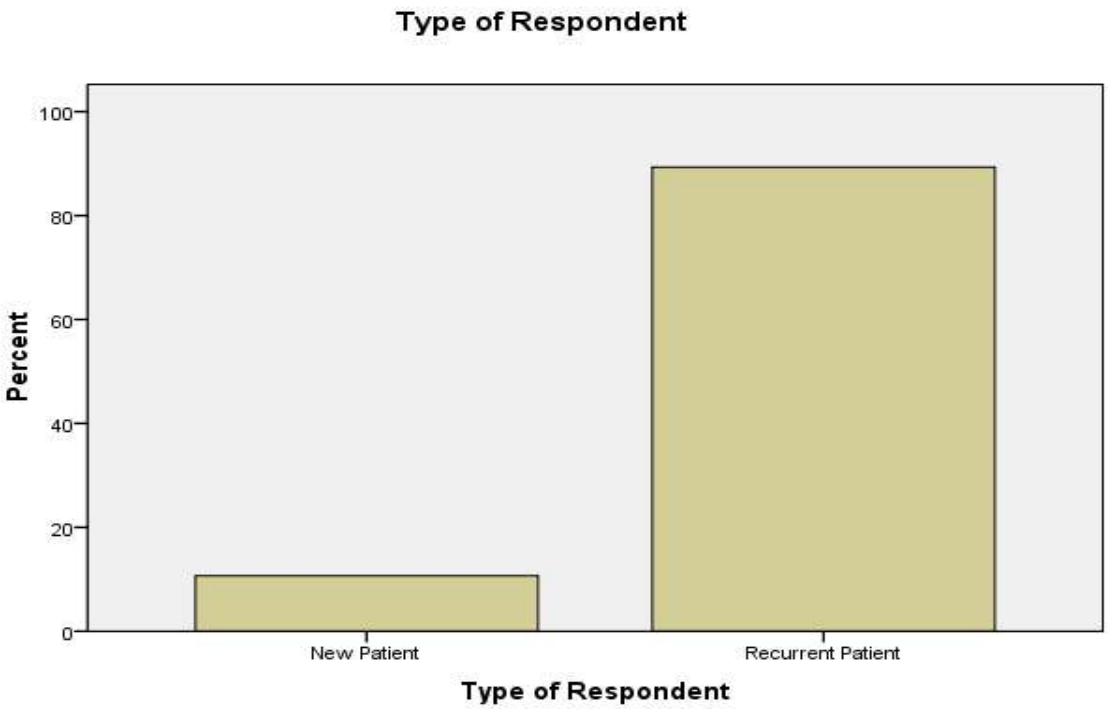


Figure 4.3 Type of Respondent

Interpretation of Table 4.3 and Figure 4.3

The table below shows type of respondent as new and recurrent patient visiting in the hospital. Visiting recurrent patient means that respondents from army background are entitled that's why they use this facility recurrent times. New patient may be civilian and may be from army background. In this table recurrent patients had high percentage (n = 335) 89.3 % and new had (n = 40) 10.7%.

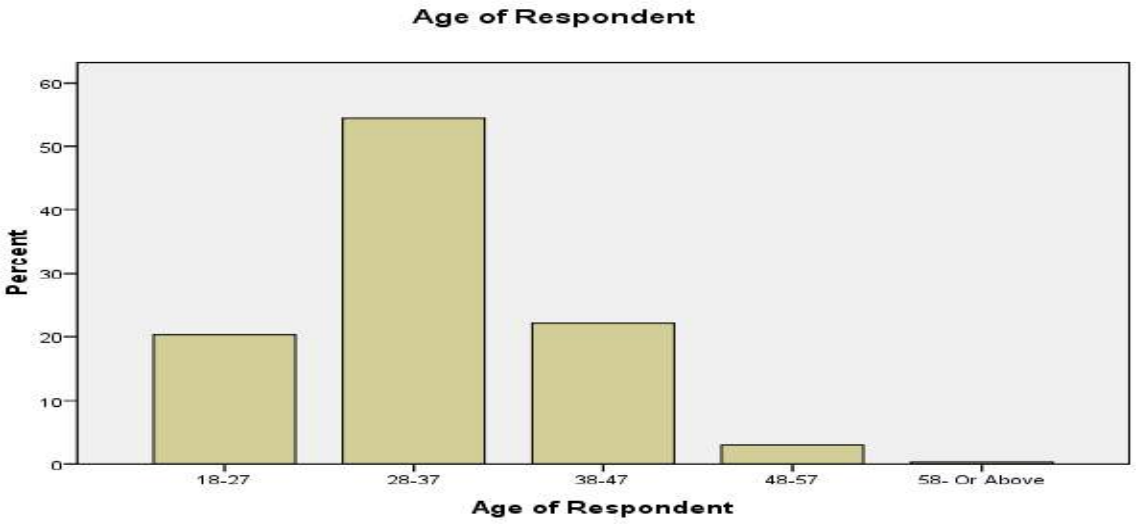
Table 4.4 Age of the Respondents

Age of Respondent

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	18-27	76	20.3	20.3	20.3
	28-37	204	54.4	54.4	74.7
	38-47	83	22.1	22.1	96.8
	48-57	11	2.9	2.9	99.7
	58- Or Above	1	.3	.3	100.0
	Total	375	100.0	100.0	

Source: Developed through field data

Figure 4.4 Age of the Respondents



Interpretation of Table 4.4 and Figure 4.4

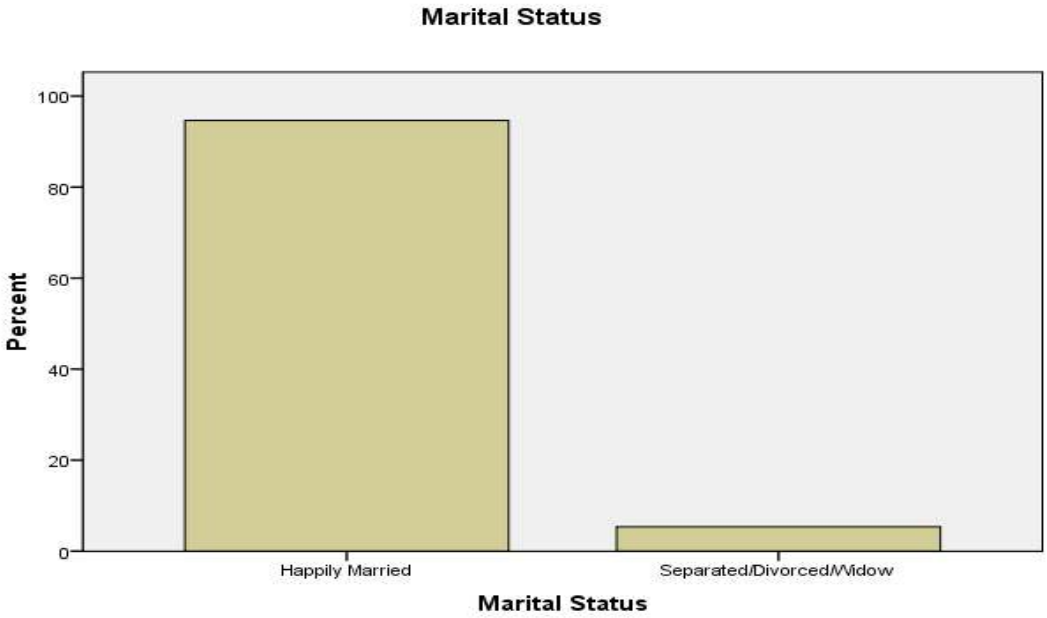
In above chart and graph, age of respondent is shown who were taking folic acids during pregnancy. It is shown that very high frequency who were taking folic acid during 28-37 years of age (n=204) 54.5% this is more fertile period of pregnancy and less percentage is falling between age of 58 or above (n=1) 3 %.

Table 4.5 Current Marital Status of the Respondents

		Frequency	Percent	Valid Percent
Valid	Happily Married	355	94.7	94.7
	Separated/Divorced/Widow	20	5.3	5.3
	Total	375	100.0	100.0

Source: Developed through field data

Table 4.5 Current Marital Status of the Respondents



Interpretation of Table 4.5 and Figure 4.5

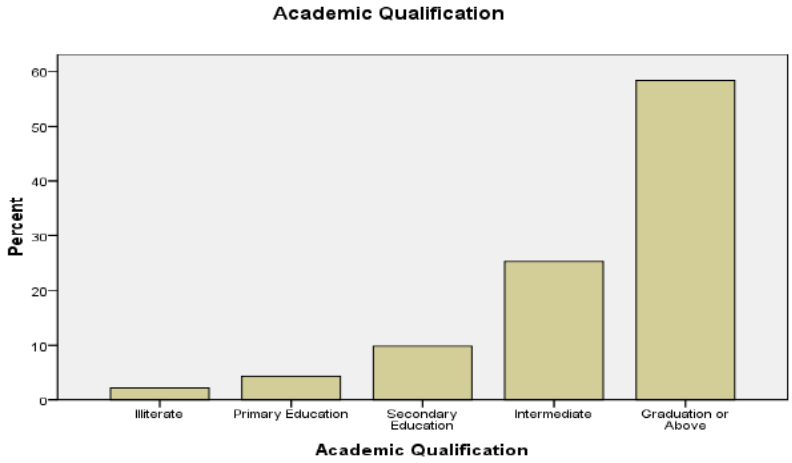
In table and graph as shown above, percentage of happily married and separated as divorced and widow is shown. Since data was collected from combined military hospital, it may be concluded that some percentage of the respondents could be the families of martyred officers. About 95% of the respondents said that they were happily living with their spouses while over 5% fell under the category of separated/divorced or widow.

Table 4.6 Academic Qualification of the Respondents

		Frequency	Percent	Valid Percent
Valid	Illiterate	8	2.1	2.1
	Primary Education	16	4.3	4.3
	Secondary Education	37	9.9	9.9
	Intermediate	95	25.3	25.3
	Graduation or Above	219	58.4	58.4
	Total	375	100.0	100.0

Source: Developed through field data

Figure 4.6 Academic Qualification of the Respondents



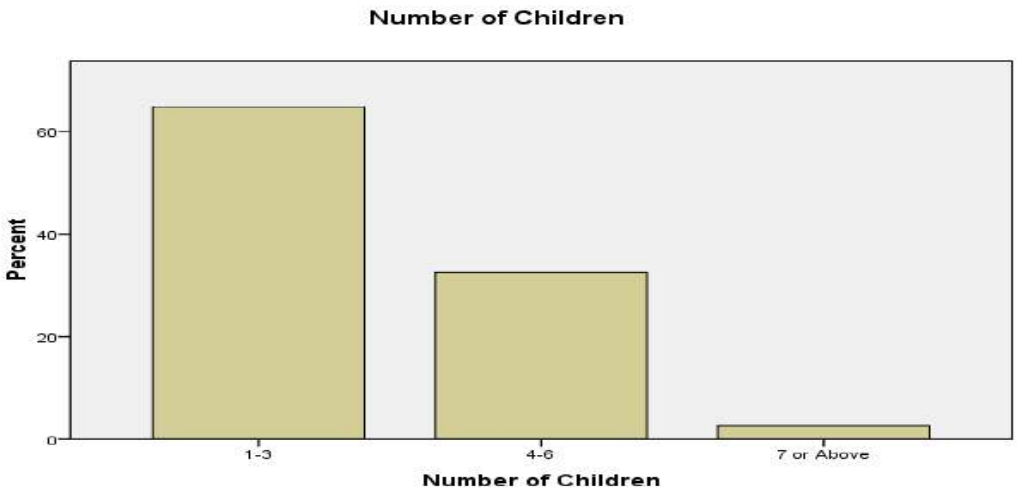
Interpretation of Table 4.6 and Figure 4.6

In the above table it is shown that most of the respondents were graduated (n = 219) 58.4% and a minute amount were illiterate (n = 8) 2.1%. Study shows that most of the respondents are well educational background may be due army background.

Table 4.7 Number of Children of the Respondents

		Frequency	Percent	Valid Percent
Valid	1-3	243	64.8	64.8
	4-6	122	32.5	32.5
	7 or Above	10	2.7	2.7
	Total	375	100.0	100.0

Figure 4.7 Number of Children of the Respondents



Interpretation of Table 4.7 and Figure 4.7

Above graph and table shows that there is high frequency of respondents having children of 1-3 (n=243) 64.8% and less percentage of having children 7 or above (n=10) 2.7%. It may be interpreted that due to high percentage of respondents from well-educated backgrounds, a clear majority of mothers having fever kids.

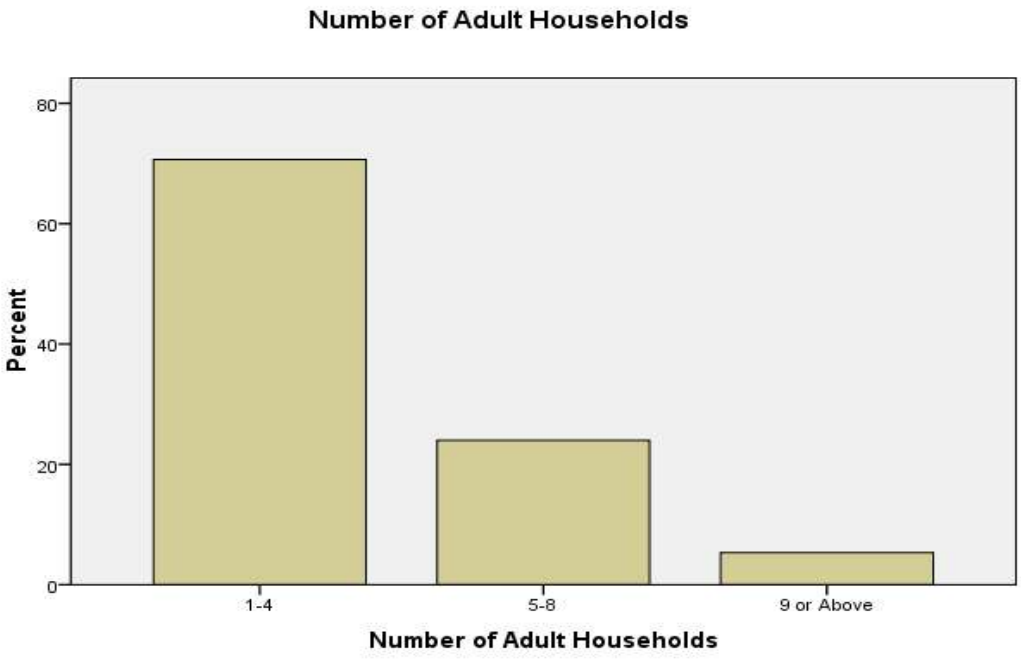


Figure 4.8 Number of Adult Households of the Respondents

Interpretation of Table 4.8 and Figure 4.8

The above table shows there is a high frequency of respondents having number of households (n=265) or 70.7% between 1-4 members whereas about 24% fell under category of 4-8 adult households and lowest percentage (5%) of respondents with 9 or above households.

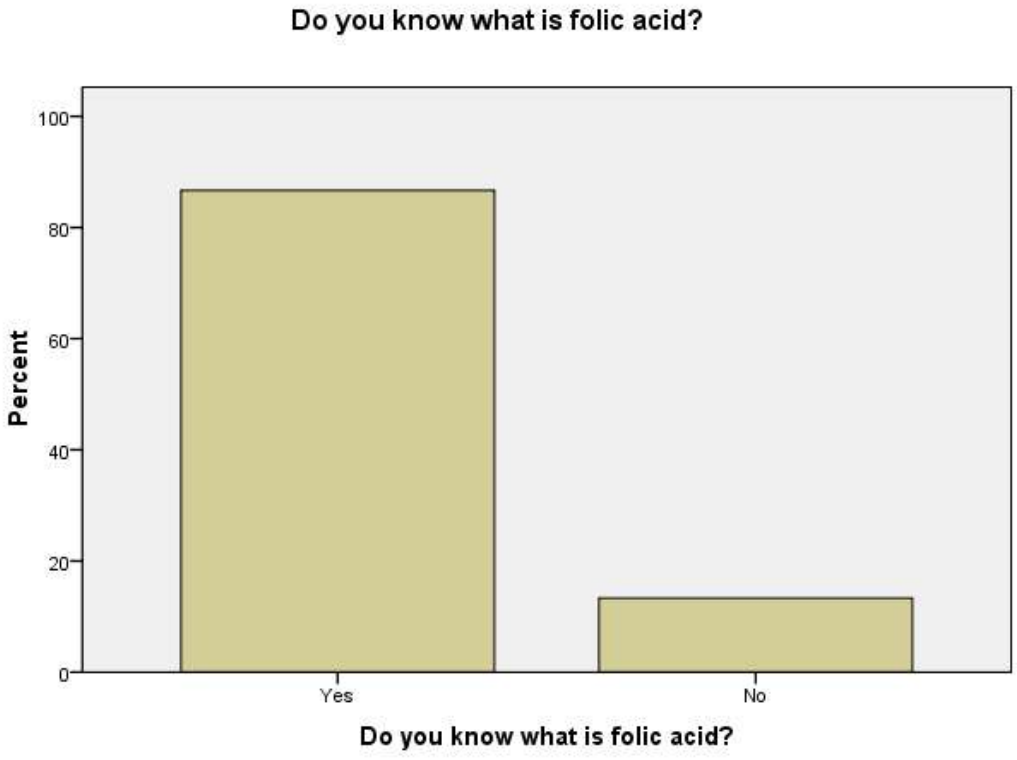
4.4 ANALYSIS OF KNOWLEDGE & AWARENESS OF MATERNAL BEHAVIOUR THROUGH DESCRIPTIVE ANALYSIS

Table 4.9 What is Folic Acid?

		Frequency	Percent	Valid Percent
Valid	Yes	325	86.7	86.7
	No	50	13.3	13.3
	Total	375	100.0	100.0

Source: Developed through field data

Figure 4.9 What is Folic Acid?



Interpretation of Table 4.9 and Figure 4.9

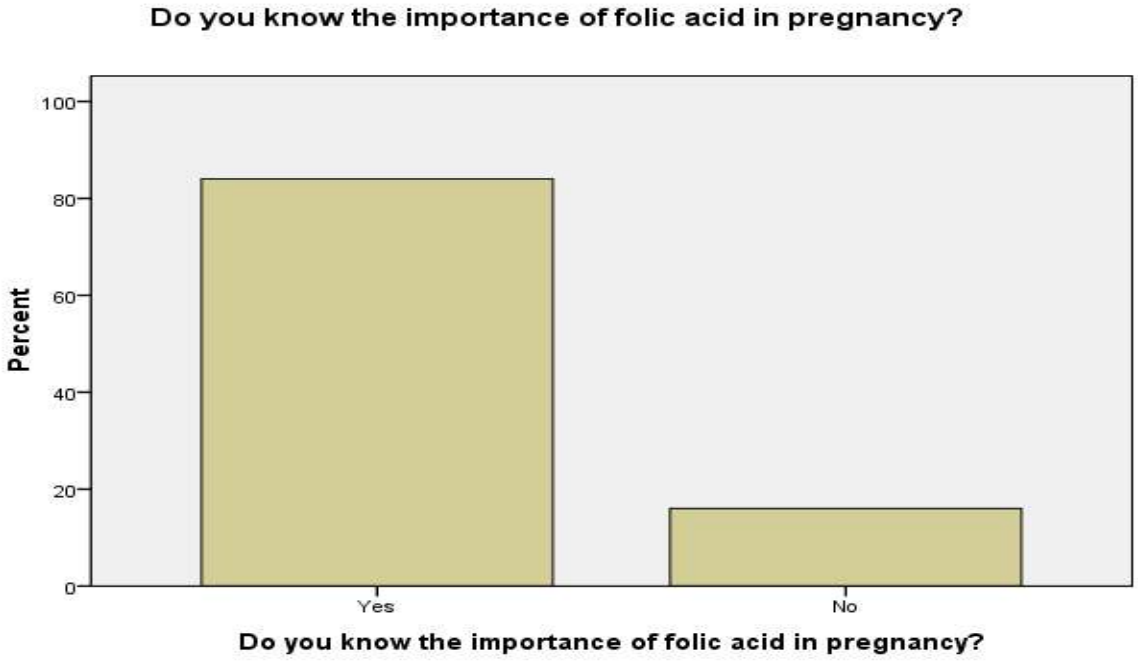
A total 325 respondents out of 375 which accounts for 86.7% of the samples, expressed that they have general know how about the Folic Acid. While only 13.3% of the respondents showed unfamiliarity towards Folic Acid. Therefore It could be interpreted that due to well-educated and army background of the respondents, they are generally aware of basic health related terms.

Table 4.10 Knowledge about the importance of Folic Acid

		Frequency	Percent	Valid Percent
Valid	Yes	315	84.0	84.0
	No	60	16.0	16.0
	Total	375	100.0	100.0

Source: Developed through field data

Figure 4.10 Knowledge about the importance of Folic Acid



Interpretation of Table 4.10 and Figure 4.10

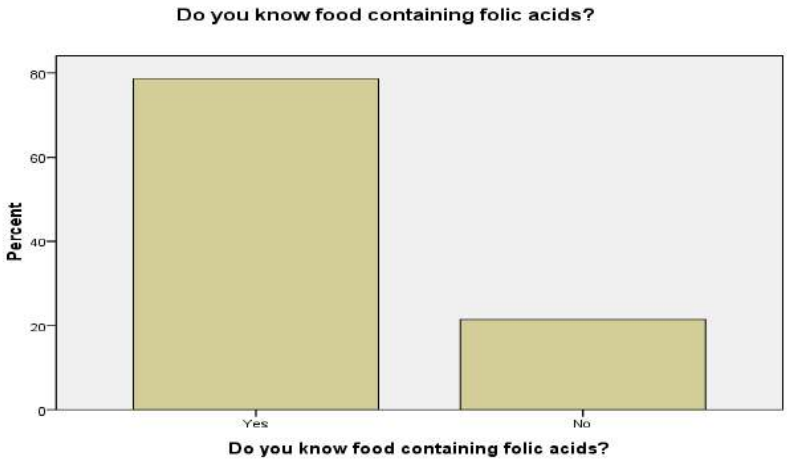
Here again most of the respondents expressed that they know about the importance of Folic Acid with (n = 315) 84% while who were not aware about this are (n=60) 16%.

Table 4.11 Knowledge about the foods containing Folic Acid

		Frequency	Percent	Valid Percent
Valid	Yes	295	78.7	78.7
	No	80	21.3	21.3
	Total	375	100.0	100.0

Source: Developed through field data

Figure 4.11 Knowledge about the foods containing Folic Acid



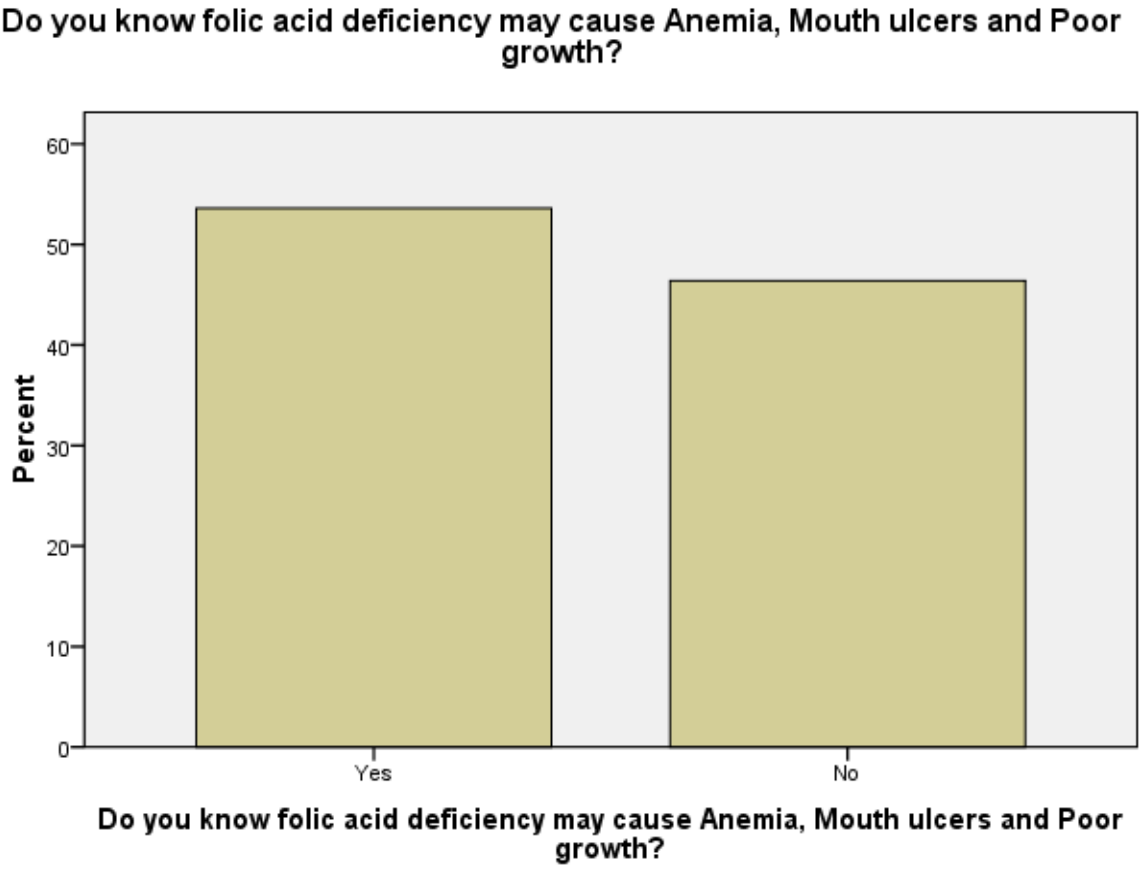
Interpretation of Table 4.11 and Figure 4.11

Those respondents who have shown to be aware about food containing Folic Acid (n=295) 78.7% and those who were not aware comprised of (n=80) 21.3%.

		Frequency	Percent	Valid Percent
Valid	Yes	201	53.6	53.6
	No	174	46.4	46.4
	Total	375	100.0	100.0

Source: Developed through field data

Figure 4.12 Knowledge about the mild deficiency of Folic Acid



Interpretation of Table 4.12 and Figure 4.12

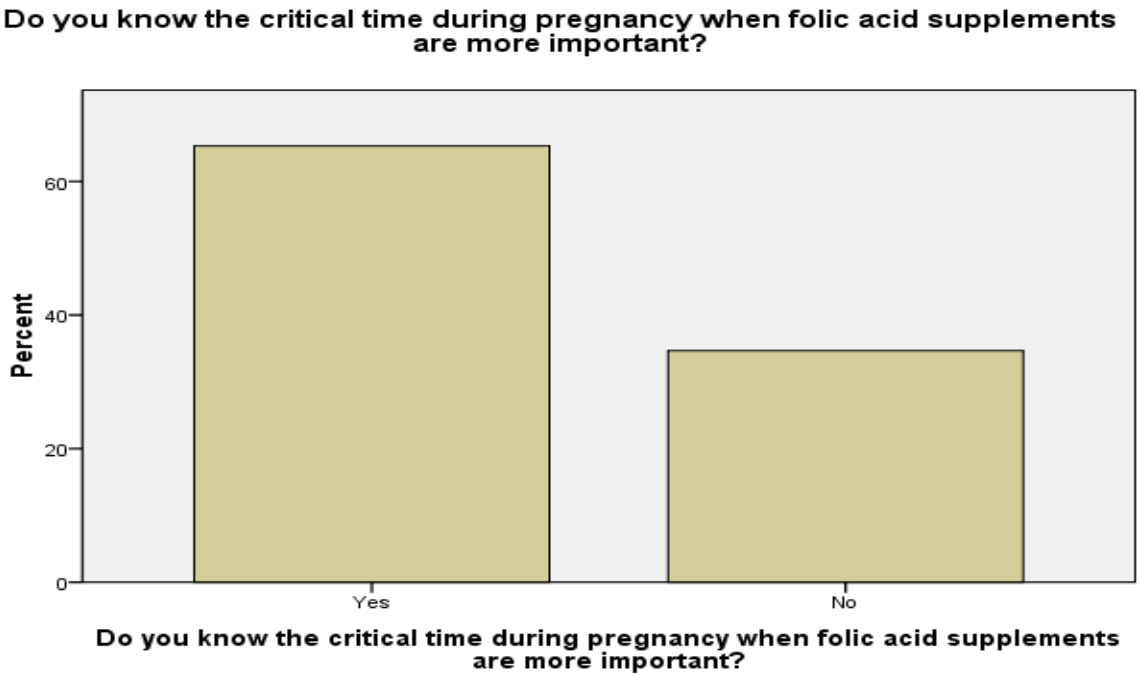
The respondents who have knowledge about mild deficiency of Folic Acid like it may cause anaemia, mouth ulcer and poor growth (n= 201) 53.6% and who had no idea (n=174) 46.4%.

Table 4.13 Knowledge about the critical time during pregnancy for Folic Acid

		Frequency	Percent	Valid Percent
Valid	Yes	245	65.3	65.3
	No	130	34.7	34.7
	Total	375	100.0	100.0

Source: Developed through field data

Figure 4.13 Knowledge about the critical time during pregnancy for Folic Acid



Interpretation of Table 4.13 and Figure 4.13

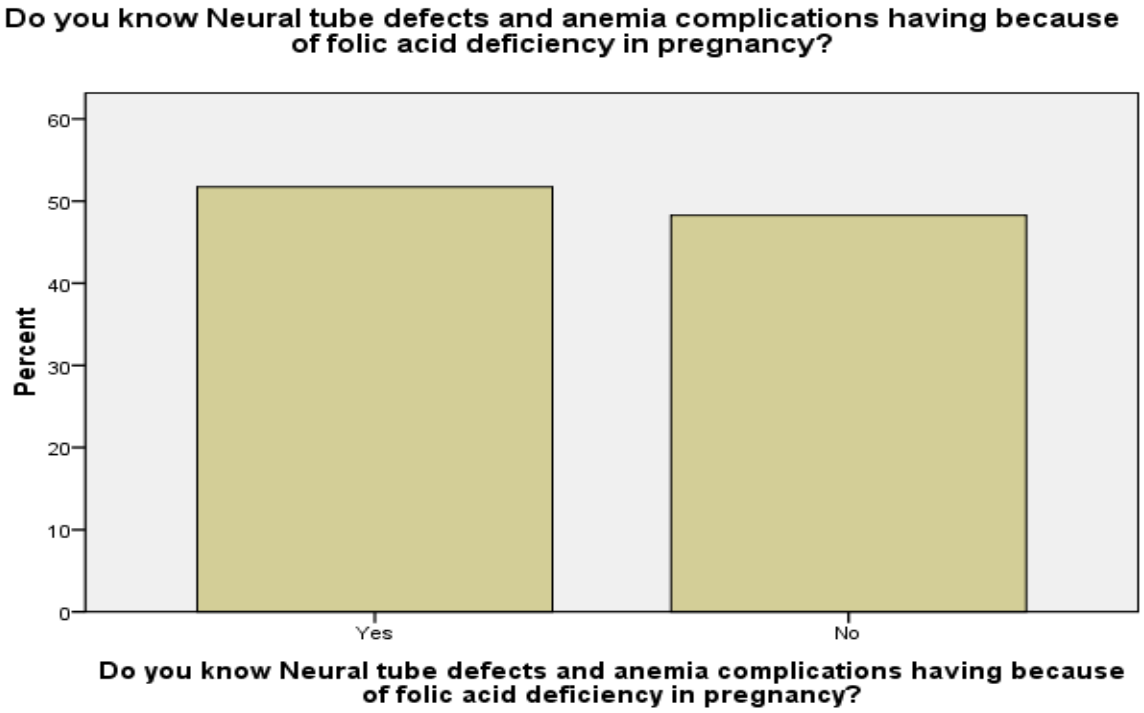
Those respondents who have knowledge about the critical time during pregnancy when folic acid supplements were more important (n=245) 65.3% and those who had no idea (n=130) 34.7%

Table 4.14 Knowledge about the chronic deficiency of Folic Acid

		Frequency	Percent	Valid Percent
Valid	Yes	194	51.7	51.7
	No	181	48.3	48.3
	Total	375	100.0	100.0

Source: Developed through field data

Figure 4.14 Knowledge about the chronic deficiency of Folic Acid



Interpretation of Table 4.14 and Figure 4.14

The respondents who have knowledge about Neural Tube Defects (NTDs) and Chronic Anaemia complications having because of Folic Acid deficiency in pregnancy (n=194) 51.7% and those who were not known (n=181) 48.3%

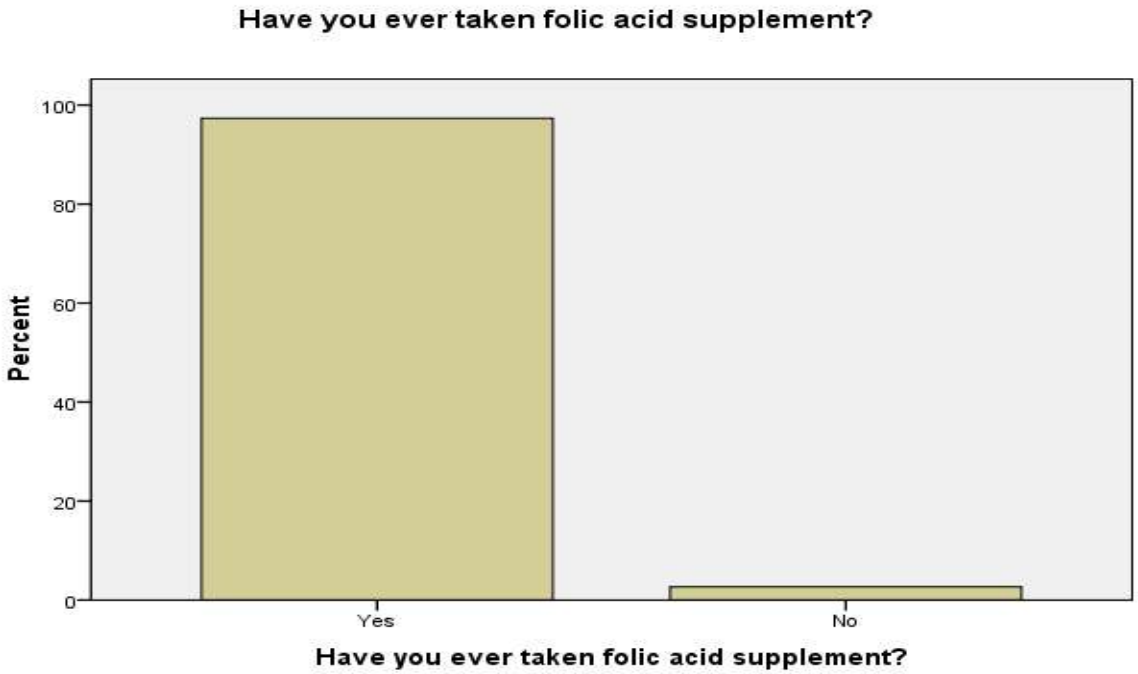
Table 4.15 Experience of taking Folic Acid as food supplement

Have you ever taken folic acid supplement?

		Frequency	Percent	Valid Percent
Valid	Yes	365	97.3	97.3
	No	10	2.7	2.7
	Total	375	100.0	100.0

Source: Developed through field data

Figure 4.15 Experience of taking Folic Acid as food supplement



Interpretation of Table 4.15 and Figure 4.15

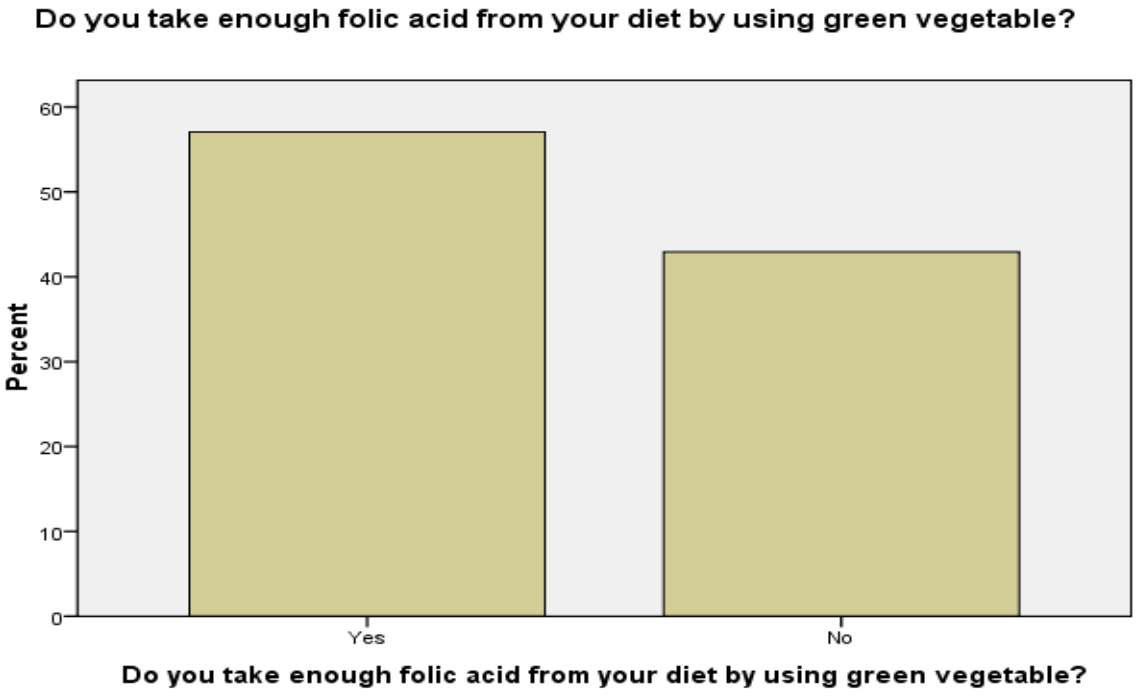
The respondents who gave answer as yes having frequency (n= 365) 365% and those who had not taken (n=10) 2.7%. It shows that a vast majority of respondents have taken Folic Acid at least once in their life during their pregnancies

Table 4.16 Taking green vegetables as diet for Folic Acid intake

		Frequency	Percent	Valid Percent
Valid	Yes	214	57.1	57.1
	No	161	42.9	42.9
	Total	375	100.0	100.0

Source: Developed through field data

Figure 4.16 Taking green vegetables as diet for Folic Acid intake



Interpretation of Table 4.16 and Figure 4.16

Those respondents who were taking folic acid from their diet having higher frequency (n=214) 57.1% and those who were not (n=161) 42.9%

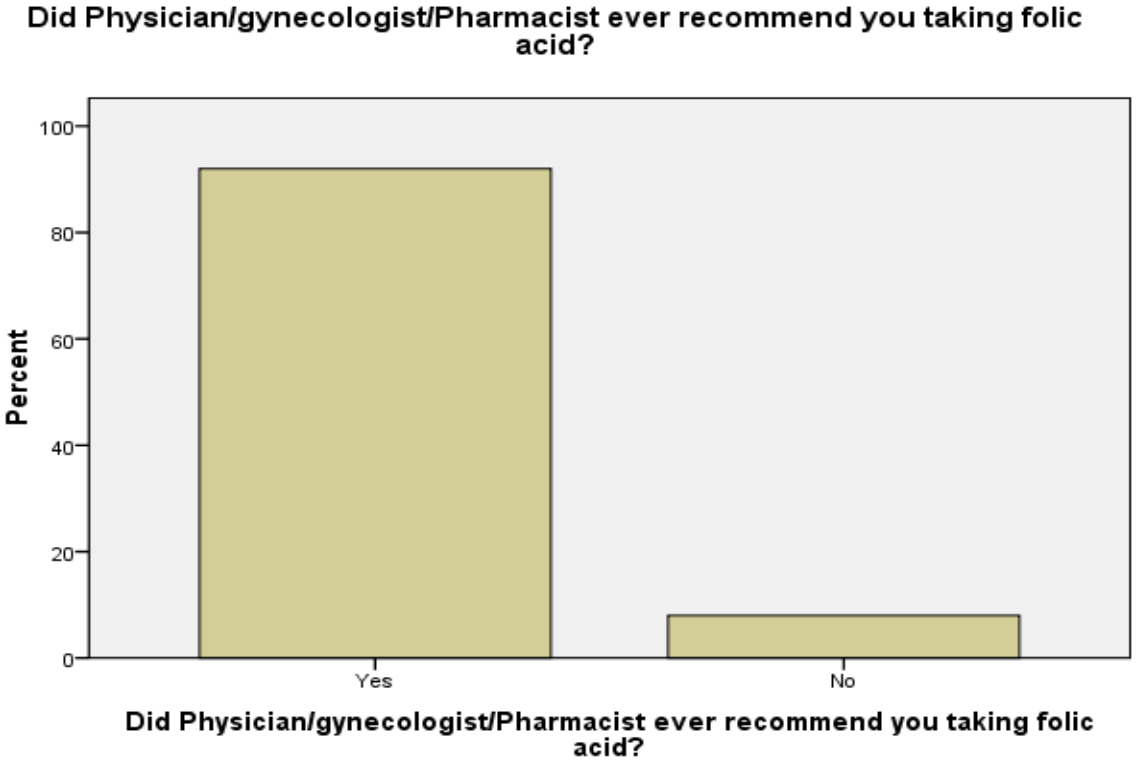
Table 4.17 Medical recommendation to take Folic Acid during pregnancy

Did Physician/gynaecologist/Pharmacist ever recommend you taking folic acid?

		Frequency	Percent	Valid Percent
Valid	Yes	345	92.0	92.0
	No	30	8.0	8.0
	Total	375	100.0	100.0

Source: Developed through field data

Figure 4.17 Medical recommendation to take Folic Acid during pregnancy



Interpretation of Table 4.17 and Figure 4.17

The respondents who were agree with above statement that they had recommendation by some healthcare professional to take Folic Acid during pregnancy have frequency (n=345) out of 375 which means 92% experience this recommendation once in their life span.

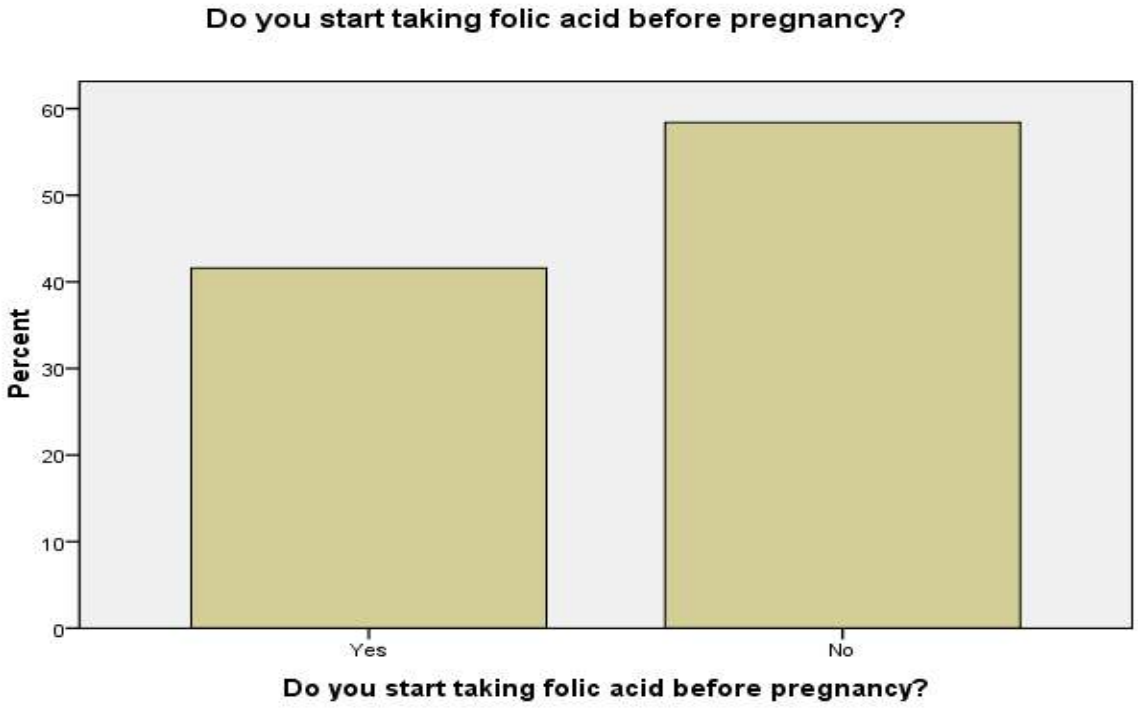
Table 4.18 Taking Folic Acid before pregnancy

Do you start taking folic acid before pregnancy?

		Frequency	Percent	Valid Percent
Valid	Yes	156	41.6	41.6
	No	219	58.4	58.4
	Total	375	100.0	100.0

Source: Developed through field data

Table 4.18 Taking Folic Acid before pregnancy



Interpretation of Table 4.18 and Figure 4.18

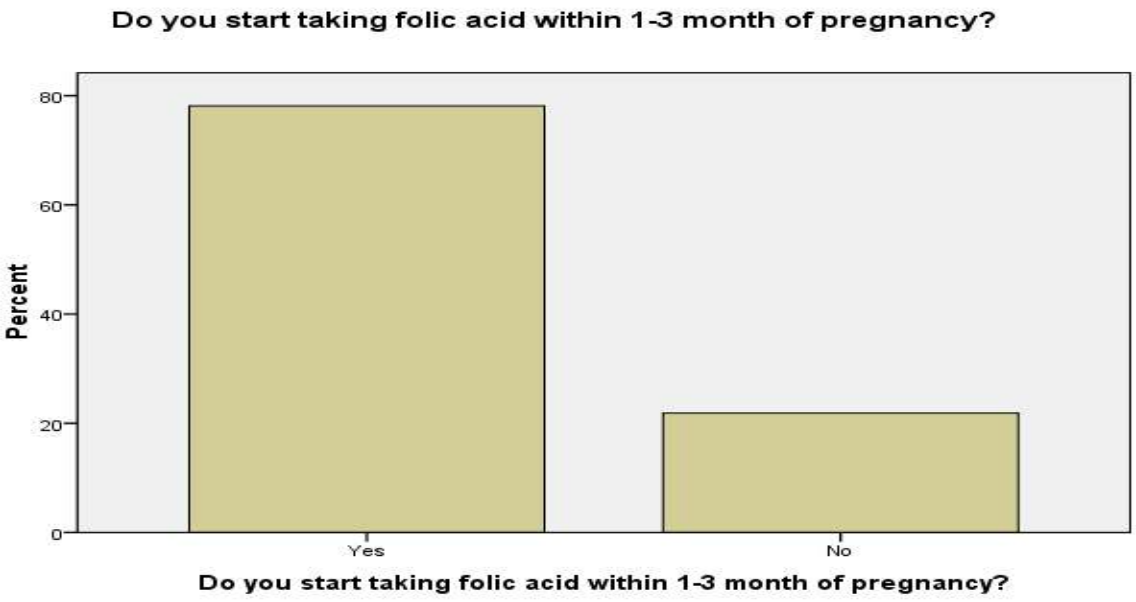
The 156 out of 375 or about 42% respondents have expressed that they have taken food supplements like Folic Acid even before pregnancies in their life span while over 58% of the maternal respondents denied this statements and showed no such intake before pregnancy.

Table 4.19 Taking Folic Acid within 1-13 weeks

		Frequency	Percent	Valid Percent
Valid	Yes	293	78.1	78.1
	No	82	21.9	21.9
	Total	375	100.0	100.0

Source: Developed through field data

Table 4.19 Taking Folic Acid within 1-13 weeks



Interpretation of Table 4.19 and Figure 4.19

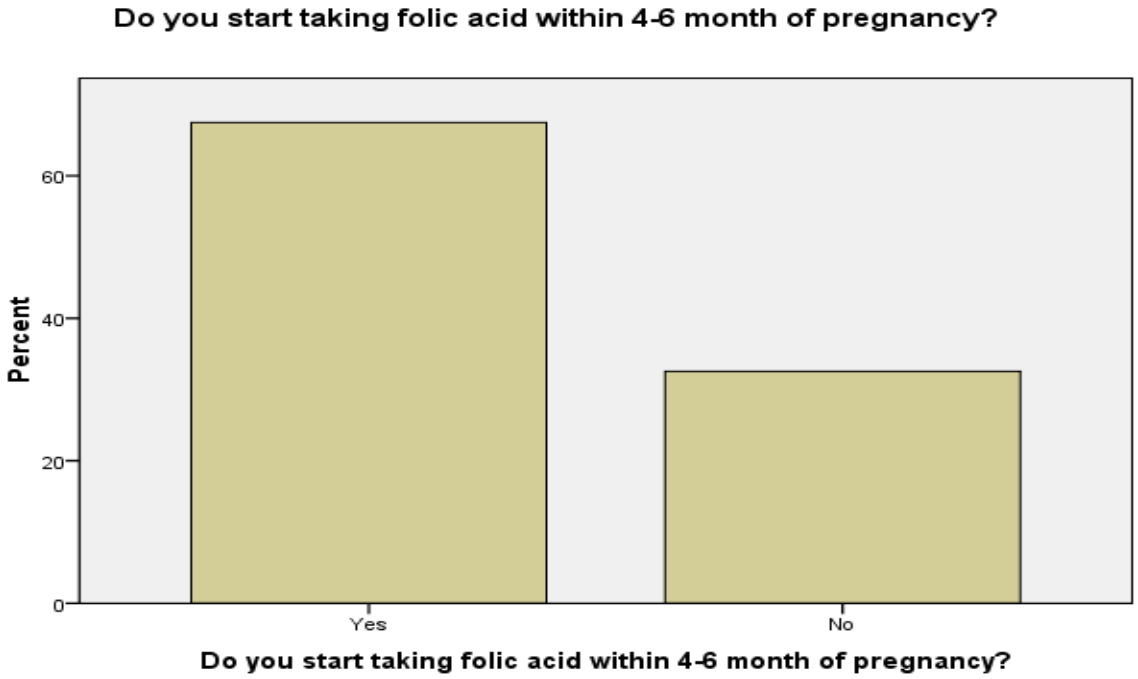
The 78% of the samples have responded that they take Folic Acid supplement during their first 13 weeks of pregnancy, while about 22% of the respondents expressed otherwise to this question.

Table 4.20 Taking Folic Acid within 14-24 weeks

		Frequency	Percent	Valid Percent
Valid	Yes	253	67.5	67.5
	No	122	32.5	32.5
	Total	375	100.0	100.0

Source: Developed through field data

Figure 4.20 Taking Folic Acid within 14-24 weeks



Interpretation of Table 4.20 and Figure 4.20

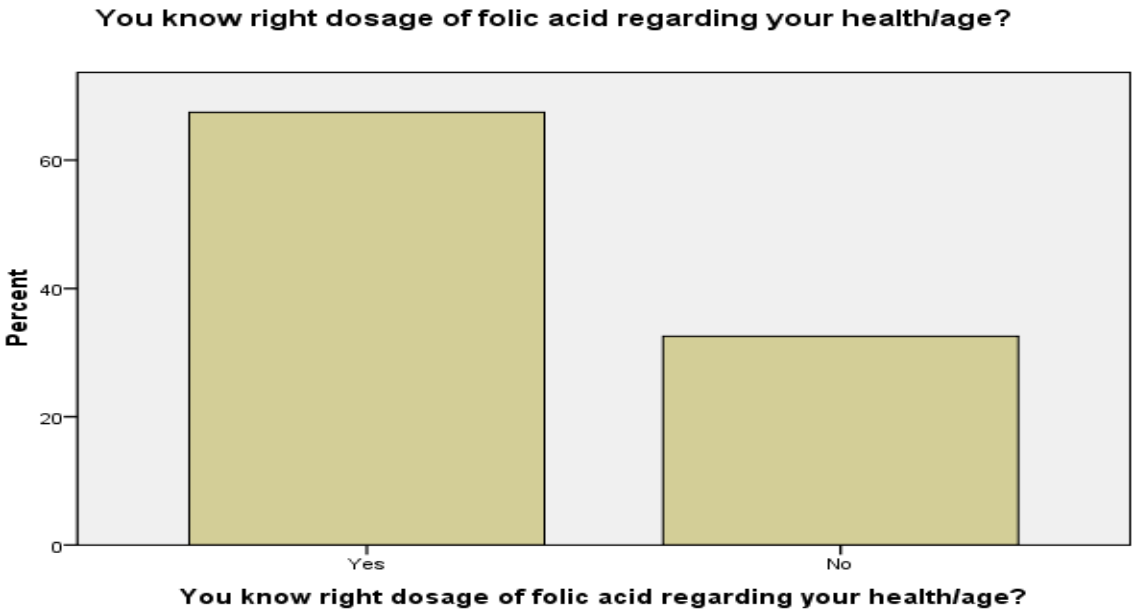
About 68% or 253 out of 375 samples have responded that they take Folic Acid supplement during their mid months like 14-24 weeks of pregnancy, while about 32% of the respondents expressed otherwise to this question.

Table 4.21 Knowledge and awareness about the right dosage of Folic Acid

		Frequency	Percent	Valid Percent
Valid	Yes	252	67.2	67.2
	No	123	32.8	32.8
	Total	375	100.0	100.0

Source: Developed through field data

Table 4.21 Knowledge and awareness about the right dosage of Folic Acid



Interpretation of Table 4.21 and Figure 4.21

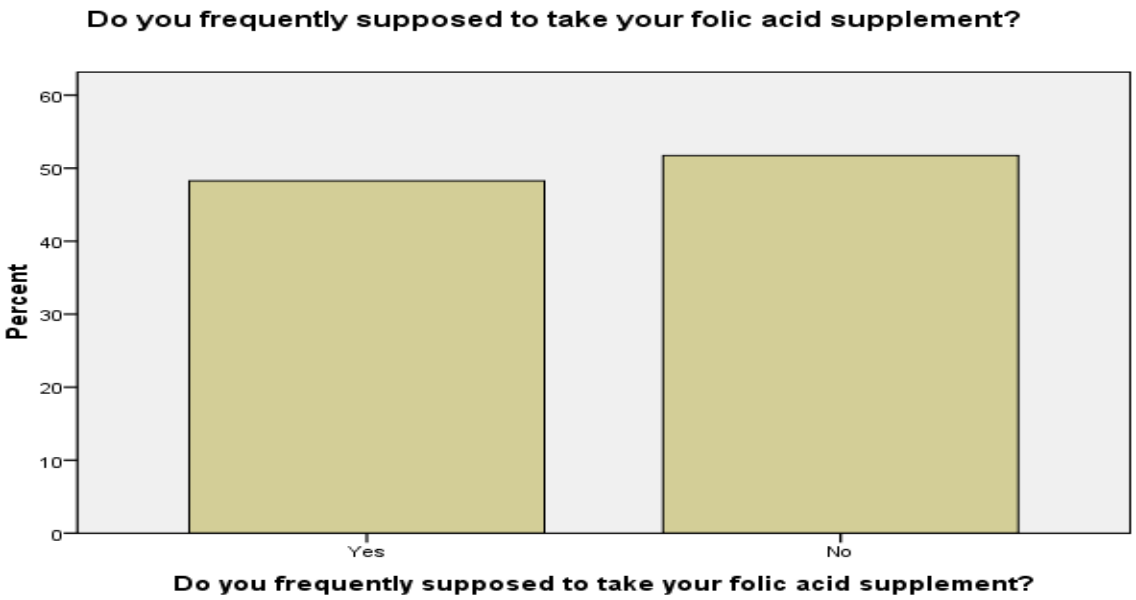
About 67% or 252 out of 375 samples have responded that they have knowledge & awareness about the right dosage of Folic Acid supplement intake during their pregnancies, while about 33% of the respondents expressed inability to this question.

Table 4.22 Knowledge and awareness about frequent intake of Folic Acid

		Frequency	Percent	Valid Percent
Valid	Yes	181	48.3	48.3
	No	194	51.7	51.7
	Total	375	100.0	100.0

Source: Developed through field data

Figure 4.22 Knowledge and awareness about frequent intake of Folic Acid



Interpretation of Table 4.22 and Figure 4.22

About 48% or 818 out of 375 samples have responded that they are supposed to take Folic Acid supplement frequently during their pregnancies, while about 52% of the respondents expressed differently to this question.

4.5 CHI SQUARE TEST OF ASSOCIATION

ANALYSIS AND DISCUSSION OF CHI SQUARE RESULTS

To test the dependency and association between different variables of the study, the chi square test is applied, the results are discussed below;

Professional affiliation of the respondents has a significant association with level of awareness and intake of Folic Acid during pregnancy period.

Chi Square test of Association between Affiliation of Respondent and Awareness related intake of Folic Acid

Variable	Statement	$\chi 2$	df	Signific.
Folic Acid -1	Do you know what Folic Acid is?	19.830	1	0.000
Folic Acid -2	Do you know the importance of folic acid in pregnancy?	9.928	1	0.002
Folic Acid -3	Do you know food containing folic acids?	1.143	1	0.285
Folic Acid -4	Do you know folic acid deficiency may cause Anaemia, Mouth ulcers and Poor growth?	24.968	1	0.000
Folic Acid -5	Do you know the critical time during pregnancy when folic acid supplements are more important?	0.282	1	0.644
Folic Acid -6	Do you know Neural tube defects and anaemia complications having because of folic acid deficiency in pregnancy?	23.304	1	0.000
Folic Acid -7	Have you ever taken folic acid supplement?	4.954	1	0.034
Folic Acid -8	Do you take enough folic acid from your diet by using green vegetable?	51.987	1	0.000

Folic Acid -9	Did Physician/gynaecologist/Pharmacist ever recommend you taking folic acid?	17.309	1	0.000
Folic Acid -10	Do you start taking folic acid before pregnancy?	12.408	1	0.001
Folic Acid -11	Do you start taking folic acid within 1-3 month of pregnancy?	45.599	1	0.000
Folic Acid -12	Do you start taking folic acid within 4-6 month of pregnancy?	27.549	1	0.000
Folic Acid -13	You know right dosage of folic acid regarding your health/age?	26.328	1	0.000
Folic Acid -14	Do you frequently supposed to take your folic acid supplement?	26.848	1	0.000

Source: Developed through field data

Interpretation of the Hypothesis-I

Chi Square test of associated is applied to analyse the association between the affiliation category of the respondents with the knowledge and awareness regarding maternal intake of Folic Acid during pregnancy. Here are the results which shows that 12 out of 14 statements are supported by this assumption that category affiliation has a strong linkage with informed mothers for taking Folic Acid. It could be interpreted that the respondents with army background & affiliation have greater chance of having compact knowledge about food supplementation due to having higher level of academic qualification.

Social background of the respondents has a significant association with level of awareness and intake of Folic Acid

Chi Square test of Association between Social background of the respondents and level of awareness & intake of Folic Acid

Variable	Statement	$\chi 2$	df	Signific.
Folic Acid -1	Do you know what Folic Acid is?	18.755	1	0.000
Folic Acid -2	Do you know the importance of folic acid in pregnancy?	23.221	1	0.000
Folic Acid -3	Do you know food containing folic acids?	33.060	1	0.000
Folic Acid -4	Do you know folic acid deficiency may cause Anaemia, Mouth ulcers and Poor growth?	47.662	1	0.000
Folic Acid -5	Do you know the critical time during pregnancy when folic acid supplements are more important?	8.995	1	0.002
Folic Acid -6	Do you know Neural tube defects and anaemia complications having because of folic acid deficiency in pregnancy?	34.356	1	0.000
Folic Acid -7	Have you ever taken folic acid supplement?	3.340	1	0.058
Folic Acid -8	Do you take enough folic acid from your diet by using green vegetable?	22.351	1	0.000
Folic Acid -9	Did Physician/gynaecologist/Pharmacist ever recommend you taking folic acid?	10.601	1	0.000
Folic Acid -10	Do you start taking folic acid before pregnancy?	1.945	1	0.102

Folic Acid -11	Do you start taking folic acid within 1-3 month of pregnancy?	8.629	1	0.002
Folic Acid -12	Do you start taking folic acid within 4-6 month of pregnancy?	58.786	1	0.000
Folic Acid -13	You know right dosage of folic acid regarding your health/age?	56.838	1	0.000
Folic Acid -14	Do you frequently supposed to take your folic acid supplement?	34.356	1	0.000

Source: Developed through field data

Chi Square test of associated is applied to analyse the association between the social background of the respondents with the knowledge and awareness regarding maternal intake of Folic Acid during pregnancy. Here are the results which shows that 13 out of 14 statements are supported by this assumption that social background that a respondent who is coming from urban background has a strong association that those mothers will be having good know how in taking Folic Acid. It could be interpreted that the respondents with urban social setting have greater chance of having compact knowledge about food supplementation due to having easy access to healthcare facilities.

The knowledge of Folic Acid usage has been influenced by academic qualification of the respondents

Chi Square test of Association between The knowledge of Folic Acid usage and academic qualification of respondents

Variable	Statement	$\chi 2$	df	Signific.
Folic Acid -1	Do you know what Folic Acid is?	228.094	4	0.000
Folic Acid -2	Do you know the importance of folic acid in pregnancy?	181.762	4	0.000
Folic Acid -3	Do you know food containing folic acids?	137.492	4	0.000
Folic Acid -4	Do you know folic acid deficiency may cause Anaemia, Mouth ulcers and Poor growth?	70.422	4	0.000
Folic Acid -5	Do you know the critical time during pregnancy when folic acid supplements are more important?	121.171	4	0.000
Folic Acid -6	Do you know Neural tube defects and anaemia complications having because of folic acid deficiency in pregnancy?	75.252	4	0.000
Folic Acid -7	Have you ever taken folic acid supplement?	57.072	4	0.002
Folic Acid -8	Do you take enough folic acid from your diet by using green vegetable?	104.764	4	0.000
Folic Acid -9	Did Physician/gynaecologist/Pharmacist ever recommend you taking folic acid?	13.283	4	0.010

Folic Acid -10	Do you start taking folic acid before pregnancy?	82.364	4	0.179
Folic Acid -11	Do you start taking folic acid within 1-3 month of pregnancy?	33.390	4	0.015
Folic Acid -12	Do you start taking folic acid within 4-6 month of pregnancy?	50.435	4	0.000
Folic Acid -13	You know right dosage of folic acid regarding your health/age?	57.341	4	0.023
Folic Acid -14	Do you frequently supposed to take your folic acid supplement?	26.848	1	0.000

Source: Developed through field data

Chi Square test of associated is applied to analyse the association between the academic qualification of the respondents with the knowledge and awareness regarding maternal intake of Folic Acid during pregnancy. Here are the results which shows that 13 out of 14 statements are supported by this assumption that academic qualification of a respondent has a significant association that well educated mothers will be having good know how in taking Folic Acid. It could be interpreted that the respondents with higher academic qualification have greater chance of having compact knowledge about food supplementation due to having more awareness of such health related information. 1 statement is shown insignificant to this claim as taking Folic Acid before pregnancy has no association with the level of education.

Age of the respondents have positive connection on effective consumption of Folic Acid during pregnancy.

Chi Square test of Association between Age of the respondents and awareness about effective consumption of Folic Acid during pregnancy.

Variable	Statement	$\chi 2$	df	Signific.
Folic Acid -1	Do you know what Folic Acid is?	61.756	4	0.000
Folic Acid -2	Do you know the importance of folic acid in pregnancy?	49.508	4	0.000
Folic Acid -3	Do you know food containing folic acids?	41.892	4	0.000
Folic Acid -4	Do you know folic acid deficiency may cause Anaemia, Mouth ulcers and Poor growth?	14.597	4	0.006
Folic Acid -5	Do you know the critical time during pregnancy when folic acid supplements are more important?	45.996	4	0.000
Folic Acid -6	Do you know Neural tube defects and anaemia complications having because of folic acid deficiency in pregnancy?	14.623	4	0.004
Folic Acid -7	Have you ever taken folic acid supplement?	40.420	4	0.000
Folic Acid -8	Do you take enough folic acid from your diet by using green vegetable?	8.452	4	0.076
Folic Acid -9	Did Physician/gynaecologist/Pharmacist ever recommend you taking folic acid?	44.431	4	0.101
Folic Acid -10	Do you start taking folic acid before pregnancy?	15.062	4	0.005

Folic Acid -11	Do you start taking folic acid within 1-3 month of pregnancy?	26.943	4	0.001
Folic Acid -12	Do you start taking folic acid within 4-6 month of pregnancy?	59.057	4	0.000
Folic Acid -13	You know right dosage of folic acid regarding your health/age?	59.450	4	0.000
Folic Acid -14	Do you frequently supposed to take your folic acid supplement?	27.502	4	0.000

Source: Developed through field data

Interpretation of the Hypothesis-IV

Chi Square test of associated is applied to analyse the association between the age of the respondents with the knowledge and awareness regarding maternal intake of Folic Acid during pregnancy. Here are the results which shows that 14 out of 14 statements are supported by this assumption that age of a respondent has a significant association that aged mothers will be having good know how in taking Folic Acid. It could be interpreted that the respondents with higher age group have greater chance of having compact knowledge about food supplementation due to having more awareness of such health related information.

Summary of the Chapter

The chapter helped to understand the results of the analysis which is undertaken with the help of demographic tables, bar charts and Chi Square test of association. The analysis showed the relationship and their effects on the prescribed model of the study. The next part will conclude the study with key findings and recommendations.

Data Summary

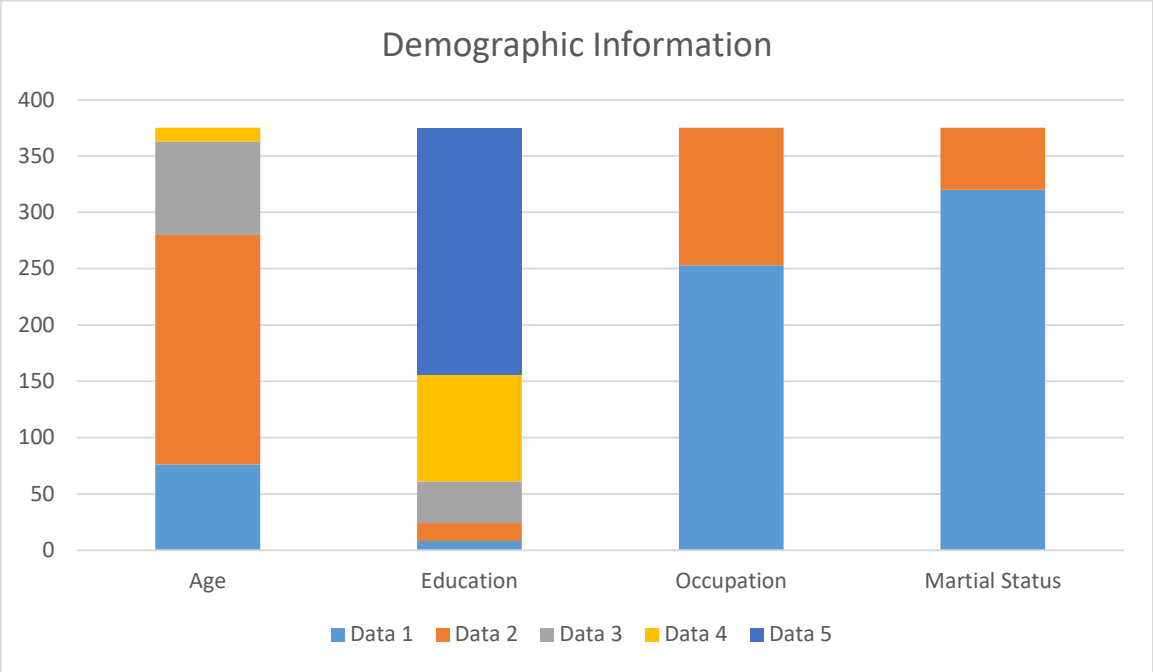
Questionnaire was comprised of following section. First, we ask demographic information like age, education, occupation etc. In next section we asked about the knowledge of pregnant women about folic acid, its importance in pregnancy, sources of folic acid, and then we asked about the attitude towards supplements (folic acid) and practice of consumption of folic acid during pregnancy.

Result was obtained are analyzed by SPSS tools i.e., statistical package of social science version 23. **Chi Square Test** method was also performed. Frequency and cross tab tools are also used to evaluate the data. Table shows the socio-demographic information about participant women regarding ages, education, occupation and marital status.

Characteristics	**Frequency**	**Percentage**
Age (Years)		
18-27	76	20.3%
28-37	204	54.4%
38-47	83	22.1%
48-57	12	3.2%
Total	375	100%
Education		
Illiterate	8	2.1%
Primary	16	4.3%
Secondary	37	9.9%
Intermediate	95	25.3%
Graduation or above	219	58.4%
Total	375	100%
Occupation		
Army	253	67.5%
Civilian	122	32.5%
Total	375	100%
Marital Status		

Married	320	94.7%
Divorced	55	5.3%
Total	375	100%

Table 4.1: Demographic information of Participants



Mean and Standard Deviation for Demographic Results

1. **Age Group:**

   Standard Deviation, σ: **69.405961559509**

   Count, N: 4
   Sum, Σx: 375
   Mean, μ: 93.75
   Variance, σ^2: 4817.1875

2. **Education**

   Standard Deviation, σ: **78.166488983451**

   Count, N: 5
   Sum, Σx: 375
   Mean, μ: 75
   Variance, σ^2: 6110

3. **Occupation:**

   Standard Deviation, σ: **65.5**

Count, N: 2
Sum, Σx: 375
Mean, μ: 187.5
Variance, σ^2: 4290.25

4. Marital Status:

Standard Deviation, σ: **132.5**

Count, N: 2
Sum, Σx: 375
Mean, μ: 187.5
Variance, σ^2: 17556.25

For assessing of knowledge of pregnant women we asked several questions about folic acid, its importance, sources of folic acid, and what complications are occurred due to deficiencies of folic acids. According to result it is clearly shown that these women had sound knowledge regarding folic acid and they know its importance very clearly.

Personal History

S. No.	Knowledge	variables	Frequency	Percent
1	Do you know what is folic acid?	Yes	325	86.7%
		No	50	13.7 %
2	Do you know the importance of folic acid in pregnancy?	Yes	315	84.0%
		No	60	16.0%
3	Do you know which food containing folic acids?	Yes	295	78.7%
		No	80	21.3%
4	Do you know folate occurs in following of food (Dark green leafy, vegetables Dried, beans and peas (legumes) and Citrus fruits and juices)?	Yes	214	57.1%
		No	161	42.9%
5	Do you know folic acid deficiency may cause Anemia, Mouth ulcers and Poor growth?	Yes	201	53.6%

		No	174	46.4%
6	Do you know folic acid supplements are more important in 1st Trimester 3rd?	Yes	245	65.3%
		No	130	34.7%
7	Do you know Neural tube defects and anemia complications having because of folic acid deficiency in pregnancy?	Yes	194	51.7%
		No	181	48.3%
8	Have you ever taken folic acid supplement?	Yes	365	97.3%
		No	10	2.7%
	Do you take folic acids regularly?	Yes	289	76.6%
		N0	88	23.4%
9	Do you take enough folic acid from your diet by using green vegetable?	Yes	214	57.1%
		No	161	42.9%
10	Did Physician/gynecologist/Pharmacist ever recommend you taking folic acid?	Yes	345	92.0%
		No	30	8.0%
12	Do you start taking folic acid before pregnancy?	Yes	156	41.6%
		No	219	58.4%
13	Do you start taking folic acid within 1-3 month of pregnancy?	Yes	293	78.1%
		No	82	19.9%
14	Do you start taking folic acid within 4-6 month of pregnancy?	Yes	253	67.5%
		No	122	32.5%

15	You know right dosage of folic acid regarding your health/age?	Yes No	252 123	67.2% 32.8%
16	Do you frequently supposed to take your folic acid supplement?	Yes No	181 194	48.3% 51.7%

CHAPTER #5

SUMMARY

Preface of the Chapter

The previous part has explored the results of the data collected from the maternal visitors of Combined Military Hospital Lahore. It has also discussed the significance of the results as well. This chapter will conclude the overall study with the salient findings, key recommendations, limitations and practical implications of the present research.

5.1 FEATURED FINDINGS

By going through the results of the study in previous chapter, there are some key findings with respect to the knowledge and awareness of maternal food supplement: Folic Acid during pregnancy.

5.1.1 DEMOGRAPHICS

Talking about the demographics of maternal respondents of CMH Lahore the results depicts that;

- Majority of the respondents are from army background as the hospital is located at Lahore Cantonment Board's Territory and visitors are normally the army personnel and their immediate family members or servants.
- It is observed that 76% of the respondents are having urban living as their social background while only 24% are from rural social living.
- A clear majority of the respondents are recurrent patients while about 11% of the total sample identified as new visitors.
- There is clear age group which is found to have visited the hospital with pregnancies in Gynecology ward or after pregnancies with their kids at Pediatrics ward, nearly 77% of the respondents were of 28-47 age category.
- About 95% of the mothers were happily married while just over 5% were either divorced/separated or widowed.
- Academic qualification of the respondents have outclassed the figures as nearly 84% of the respondents fall under higher education category, this is the main

reason behind the updated knowledge of folic acid among the respondents of CMH visitors.

- Results showed that about 65% of the sampled mothers have expressed that they are having up to 3 kids.

5.1.2 FINDINGS FROM CHI SQUARE TESTS

Chi Square test applied to test whether there is a significant relationship between respondent category, social background, academic qualification, and age of the respondent with the general awareness of maternal food supplements during pregnancy. The key findings are discussed below;

- The results which shows that 12 out of 14 statements are supported by this assumption that category affiliation has a strong linkage with informed mothers for taking Folic Acid. It could be interpreted that the respondents with army background & affiliation have greater chance of having compact knowledge about food supplementation due to having higher level of academic
- The findings further explore that shows that 13 out of 14 statements are supported by this assumption that social background that a respondent who is coming from urban background has a strong association that those mothers will be having good know how in taking Folic Acid. It could be interpreted that the respondents with urban social setting have greater chance of having compact knowledge about food supplementation due to having easy access to healthcare
- Here are the results which shows that 13 out of 14 statements are supported by this assumption that academic qualification of a respondent has a significant association that well educated mothers will be having good know how in taking Folic Acid. It could be interpreted that the respondents with higher academic qualification have greater chance of having compact knowledge about food supplementation due to having more awareness of such health related information. 1 statement is shown insignificant to this claim as taking Folic Acid before pregnancy has no association with the level of education.
- Here are the results which shows that 14 out of 14 statements are supported by this assumption that age of a respondent has a significant association that aged mothers will be having good know how in taking Folic Acid. It could be interpreted that the respondents with higher age group have greater chance of

having compact knowledge about food supplementation due to having more awareness of such health related information.

5.2 CONCLUSION

This study was about knowledge and awareness of food supplement like Folic Acid in mothers at Combined Military Hospital (CMH) Lahore, which is run & operated by Pakistan Army, and known as one of the most well managed hospital in Pakistan. The visitors of this hospital are normally the in service and retired army personnel and their families. This research was aimed to gauge the degree of awareness of Folic Acid among the mothers of CMH, where the mostly visitors were found pretty aware about the basics of personal healthcare items like Folic Acid. The respondents found well educated and stable backgrounds with solid knowledge of food supplement like folic acid. The results are comparatively more visible than the previous studies. Findings show that age, education, social background and affiliation has strong and positive impact on intake, dosage, consumption and awareness of Folic Acid during pregnancy.

DISCUSSION

This assessment shows that there is huge impact of using folic acids during pregnancy. Women who uses folic acids regularly during pregnancy have better health and also better child as compare to the women who don't use folic acids on time. With the result of this assessment the knowledge of some other important factors (Relationship of knowledge and age, relationship of education and knowledge and relationship of education and practice) also gained which is plus point of the study.

A descriptive cross-sectional study was conducted in CMH Lahore, Pakistan to find out effect of use of folic acid during pregnancy. Data of 377 married women were analyzed and it is found according to our result only 58.8% women are using folic acid before pregnancy and 40% start using in their first trimester of pregnancy. The attitude of pregnant women about folic acid is not satisfying; according to our result almost more than 50% women don't used folic acid. But most disturbing situation is this that more than half percent women also don't use green foods in their diet. Almost 80% these women are recommended by physician to used folic acid. (Results are shown in table: 4.5)

By analyzing their attitude towards folic acid, Results shown that a critical population (pregnant ladies) don't know the right dosage of folic acids. Only 40% women knows the right dosage for their daily routine. So, there is a great need to educate the pregnant ladies to prevent ladies from birth defects.

In past year several studies were performed for assessing knowledge of child bearing age towards folic acid it is found in 1996 only 41% women are known importance of this vitamin in UK, then in Ireland in 1997 study the knowledge rate was found to be 63.6%. In 1999 in USA only 57% women having awareness, in 2000 in Spain the awareness rate is 50% and so on, the complete result is shown in figure: 1 which shows different studies performed in different countries and the knowledge rate of their women. (Sobia Jamil, 2017)

Based on all past and present researches about folate, there is one thing is common which is the right and regular dosage of folic especially in pregnancy to prevent casualties and to limit the neural tube defect or congenital disease.

5.3 LIMITATIONS

The patients of any hospital are always difficult to interact as the time they visit the hospital is very crucial and they are worried about their treatment more than anything else happening in the sidelines of such facilities. On the other hand the respondents are seriously concerned about their data privacy and ethical consideration of being a part of social researches. Indeed, it was extremely testing to cope with all the field challenges during the time of ongoing pandemic (Covid-19). The cost and time were the greatest of all limitations faced during the course of this research. It incorporates all the related expenses, for example, expense of going to the field, expenses of transport, photocopying the research tools & material and so on. Since it was an academic research which was undertaken for fulfilment of a Degree, the research was self-funded by the scholar with her own resources.

Data for the present study was gathered from the CMH Lahore alone because of resource limitations. Future investigates can be stretched out by taking sample from all significant rural as well as urban areas of Pakistan.

5.4 SUGGESTIONS FOR FUTURE RESEARCH

Based on the research following recommendations are made to decrease the possible pregnancy defects

1. Education should be necessary at least graduation
2. Awareness about the usage of folic acids should spread through health workers, pharmacist, social media, hospitals and home visits.\

Government Should play its vital role about using folate by initiating programs and providing free folic acids to rural areas especially.

CONSENT FORM (URDU):

ریسرچ سٹڈی میں شرکت کا دعوت نامہ شمولیت کی دعوت دیتا /دیتی ہوں

نقصانات اور تکلیف: اس تحقیق سے کسی قسم کے نقصان یا تکلیف کا اندیشہ نہیں ہے ۔

رازداری کا تحفظ: ہم آپ کی معلومات کے تحفظ کے لیے وہ سب کچھ کریں گے جو ہم کر سکتے ہیں۔ تحقیق کے متعلق اکٹھی کیی گیی تمام معلومات کو انتہا ئی خفیہ رکھا جاے گا۔ ڈیٹا انٹری اور تجزیے کے دوران آپ کے متعلق وہ تمام معلومات جن سے آپ کی شناخت ہو سکتی ہو کو ختم کر دیا جاے گا۔ اس تحقیق کے نتیجے میں شائع ہونے والی کسی بھی اشاعت میں آپ کی شناخت کو ظاہر نہیں کیا جاے گا۔

رضاکارانہ شمولیت: اس تحقیقی مطالعہ میں آپ کی شرکت رضاکارانہ ہے۔ آپ کو شرکت نہ کرنے اور کسی بھی وقت پغیر وجہ بتانے اس تحقیق میں شمولیت کو چھوڑنے کا اختیار ہے۔ شرکت نہ کرنے یا اس میں شمولیت کو چھوڑنے کی صورت میں آپ کے خلاف کوئی کاروایی نہیں کی جاے گی

رابطے کی معلومات: اگر آپ کو اس مطالعے میں کوئی سوالات یا خدشات ہیں یا اگر کوئی مسئلہ پیدا ہو تو رابطہ کریں۔ موبائل03062526791

- میں سمجھ گیا/گیی ہوں کہ میری شرکت رضاکارانہ ہے اور یہ کہ میں کسی بھی وقت اپنا ارادہ بدل سکتا/سکتی ہوں اور تحقیق سے دستبردار ہو سکتا/سکتی
- میں سمجھ گیا/گیی ہوں کہ میرے جوابات خفیہ رکھے جاءیں گے۔ میں محقیقیین کو اس بات کی اجازت دیتا/دیتی ہوں کے وہ جوابات کو جانچ سکیں۔
- میں سممجھ گیا/گی ہوں کے معلومات میرے نام کے بجاے نمبر کی صورت میں محفوظ کی جائیں گی۔ تا کہ میں نتائج کی اشاعت کے دوران کسی بھی طرح سے شناخت نہ کیا جا سکوں۔ میں اس بات سے رضامند ہوں کے جو معلومات مجھ سے لی جائہیں گی وہ تحقیق میں استعمال ہوں گی۔
- میں اوپر بتایی گی تحقیق میں شامل ہونے کے لیے رضامند ہوں اور محقیقین کو اپنا پتہ تبدیل ہونے کی صورت میں مطلع کروں گا/گی۔

رضا مندی:میں نے یہ اجازت نامہ پڑھا ہے اور مجھے سوال پوچھنے کا موقع دیا گیا ہے۔ میں اس سٹڈی میں شرکت کے راضی ہوں۔

شرکت کنندہ کا نام _____ دستخط _____تاریخ_____

اجازت لینے والے کا نام_____ دستخط _____تاریخ_____

اس اجازت نامہ کی ایک نقل آپکو دی جانی چاہیے۔

CONSENT FORM

Folic Acid Supplementation during Pregnancy

"Consent to take part in Research"

- I.....voluntarily agree to participate in this research study.
- I understand that even if I agree to participate now, I can withdraw at any time or refuse to answer any question without any consequences of any kind.
- I understand that I can withdraw permission to use data from my interview within two weeks after the interview, in which case the material will be deleted.
- I have had the purpose and nature of the study explained to me in writing and I have had the opportunity to ask questions about the study.
- I understand that participation involves about supplementation of folic acid
- I understand that I will not benefit directly from participating in this research.•I agree to my interview being audio-recorded.
- I understand that all information I provide for this study will be treated confidentially.
- I understand that in any report on the results of this research my identity will remain anonymous. This will be done by changing my name and disguising any details of my interview which may reveal my identity or the identity of people I speak about.
- I understand that disguised extracts from my interview may be quoted in dissertation, conference presentation and published papers.
- I understand that if I inform the researcher that myself or someone else is at risk of harm they may have to report this to the relevant authorities -they will discuss this with me first but may be required to report with or without my permission.
- I understand that a transcript of my interview in which all identifying information has been removed will be retained for [specific relevant period –for students this will be two years from the date of the exam board].
- I understand that under freedom of information legalization I am entitled to access the information I have provided at any time while it is in storage as specified above.
- I understand that I am free to contact any of the people involved in the research to seek further clarification and information.

Signature of research participant

---------- ---------

Signature of participant Date

Signature of researcher

I believe the participant is giving informed consent to participate in this study

---------- ---------

Signature of researcher Date

REFERENCES

Annabelle C Chan DPH, D. F.-M. (2008). Folate awareness and the prevalence of neural tube defects in South Australia, 1966–2007. *MJA*, 566-569.

Armando Fuentes, M. (5, 10 2018). *Folic Acid and Pregnancy*. Retrieved from Kidshealth: https://kidshealth.org/en/parents/preg-folic-acid.html

Ashraful Alam, c. a. (2015). How can formative research inform the design of an iron-folic acid supplementation intervention starting in first trimester of pregnancy in Bangladesh? *BMC Public Health*, v 15.

Author links open overlay panelLolkje T.W.de Jong-van den BergPharmD, P.-D. P. (2005). rends and predictors of folic acid awareness and periconceptional use in pregnant women. *American Journal of Obstetrics and Gynecology*, 121-128.

Bhutta, Z. A. (2009). A comparative evaluation of multiple micronutrient and iron-folic acid supplementation during pregnancy in Pakistan: impact on pregnancy outcomes. *NCBI*, 496-505.

Bodnar LM, H. K. (2010). Maternal serum folate species in early pregnancy and risk of preterm birth. *Am J Clin Nutr*, 864-71.

Breige McNulty, H. M. (2013). Impact of continuing folic acid after the first trimester of pregnancy: findings of a randomized trial of Folic Acid Supplementation in the Second and Third Trimesters. *The American Journal of Clinical Nutrition, Volume 98, Issue 1*, 92-98.

Camila Atallah Pontes da Silva, C. A. (2010). Evaluation of calcium and folic acid supplementation in prenatal care in São Paulo.

Cathrine Hoyo, A. P.-W. (2011). Folic acid supplementation before and during pregnancy in the Newborn Epigenetics STudy (NEST). *BMC Public Health*, 46.

Catrina L. McStay, S. L. (2017). Maternal Folic Acid Supplementation during Pregnancy and Childhood Allergic Disease Outcomes: A Question of Timing? *Nutrients*, 123.

Fan C, Y. S. (2017). Association between folate intake and risk of head and neck squamous cell carcinoma: An overall and dose-response PRISMA meta-analysis. *Medicine*

(Baltimore), 96(42). Retrieved from WebMD: https://www.webmd.com/vitamins/ai/ingredientmono-1017/folic-acid

Hanif, A. A. ((2017)). Prevalence of Preterm Birth in Pakistan:. *A Systematic Review and Meta-Analysis. Annals of King Edward Medical University,* , 23(2).

Helene McNulty, M. R.-M. (2019, October 31). *Articles*. Retrieved from BMC Medicine: https://bmcmedicine.biomedcentral.com/articles/10.1186/s12916-019-1432-4

Helene McNulty, M. R.-M. (2019). Effect of continued folic acid supplementation beyond the first trimester of pregnancy on cognitive performance in the child: a follow-up study from a randomized controlled trial (FASSTT Offspring Trial). *BMC Medicine*, 92-98.

Helene McNulty, M. R.-M. (2019). ffect of continued folic acid supplementation beyond the first trimester of pregnancy on cognitive performance in the child: a follow-up study from a randomized controlled trial (FASSTT Offspring Trial). *BMC Medicine Journal* , 196.

James A Greenberg, 1. S.-h. (2011). Folic Acid Supplementation and Pregnancy: More Than Just Neural Tube Defect Prevention. *Rev Obstet Gynecol*, 52–59.

James A Greenberg, M. S.-h. (2011). Folic Acid Supplementation and Pregnancy: More Than Just Neural Tube Defect Prevention. *Rev Obstet Gynecol*, 52-59.

Jolien Steenweg–de Graaff, S. J. (2012). Maternal folate status in early pregnancy and child emotional and behavioral problems: the Generation R Study. *The American Journal of Clinical Nutrition, Volume 95, Issue 6*, 1413-1421.

Jolien Steenweg-de Graaff, S. J. (2017). Associations of maternal folic acid supplementation and folate concentrations during pregnancy with foetal and child head growth: the Generation R Study. *European Journal of Nutrition*, 65-75.

Khan, K. M., & Jialal, I. (2020). Folic Acid Deficiency. *PMID*.

Kristeen Cherney, P. (2016, March 24). *pregnancy*. Retrieved from healthline: https://www.healthline.com/health/pregnancy

McDermott, A. (2020, 10 12). *HealthLine*. Retrieved from HealthLine Parenthood: https://www.healthline.com/health/pregnancy/folic-acid

Molloy, A. M. (2008). Effects of folate and vitamin B12 deficiencies during pregnancy on fetal, infant, and child development. *Food and Nutrition Bulletin, vol. 29, no. 2 (supplement)*.

Pitkin, R. M. (2007, Jan 01). Folate and neural tube defects. *The American Journal of Clinical Nutrition*, pp. 285s-288s.

Rebecca J. Schmidt, V. K.-P. (2017). Combined Prenatal Pesticide Exposure and Folic Acid Intake in Relation to Autism Spectrum Disorder. *Environ Health Perspect*, v 125(9).

Sanghvi TG, H. P. (2010). Maternal iron-folic acid supplementation programs: evidence of impact and implementation. *PMID, Food Nutr Bull*, 07.

Schmidt, R. e. (2012). Maternal periconceptional folic acid in take and risk of autism spectrum disorders and developmental delay in the CHARGE (CHildhood Autism Risks from Genetics andEnvironment) case-control study. *The American journal of clinical*, 80-89.

Shi Wu Wen, J. C. (2013). Effect of Folic Acid Supplementation in Pregnancy on Preeclampsia: The Folic Acid Clinical Trial Study. *Clinikal Study*, 26.

Sidra. (2017). Knowledge Attitude & Practice of Folic Acid Consumption in Pregnant. *International Journal of Pharma Sciences and*, 75-82.

SM, S. (2008). *, Stahl's Essential Psychopharmacology: Neuroscientific Basis and Practical Applications.* New York: Cambridge University Press.

Sobia Jamil, S. k. (2017). Knowledge Attitude & Practice of Folic Acid Consumption in Pregnant. *International Journal of Pharma Sciences and*, 75-82.

Sophia Entringer, P. (2019, jan 4). *Folic acids*. Retrieved from Drugs.com: https://www.drugs.com/folic_acid.html

Sreenivas P. Veeranki, a. T. (2015). Maternal Folic Acid Supplementation during Pregnancy and Early Childhood Asthma. *Epidemiology*, 934-941.

Subit Barua, S. K. (2014, August 19). Folic acid supplementation in pregnancy and implications in health and disease. *Journal of Biomedical Science*, p. 77.

Sufang Wang, 1. X. (2016). Maternal Continuing Folic Acid Supplementation after the First Trimester of Pregnancy Increased the Risk of Large-for-Gestational-Age Birth: A Population-Based Birth Cohort Study. *Journal List Nutrients* , 493.

Traci C. Johnson, M. (2018, june 02). *Folic-acid-and-pregnancy*. Retrieved from WebMD: https://www.webmd.com/baby/folic-acid-and-pregnancy#1

Yasir Bin Nisar, A. A. (2014). Perceptions of antenatal iron-folic acid supplements in urban and rural Pakistan: a qualitative study. *BMC Pregnancy and Childbirth*, 344.

ANNEXURE-I

QUESTIONNAIRE

Assessment of Maternal Behaviour Regarding Supplementation (Folic Acid) Usage during Pregnancy

---

The purpose of this study is to have assessment of maternal behaviour regarding supplementation (Folic Acid) usage during pregnancy. Your valuable response in this regard would be highly appreciated, will be kept strictly confidential and to be used only for academic research purpose.

Tahira Kanwal (MPH SCHOLAR)

Department of Public Health, GC University, Faisalabad

kanwaltahira865@gmail.com

I-DEMOGRAPHICS

1-Respondent's Category (1) Army ☐ (2) Civilian ☐

2-Respondent's Background: (1) Rural ☐ (2) Urban ☐

3-Type of Respondent: (1) New Patient ☐ (2) Recurrent Patient ☐

4-Age (Years): (1) 18-27 ☐ (2) 28-37 ☐ (3) 38-47 (4) 48-57 ☐ (5) 58 Or Above ☐

5-Marital Status: (1) Happily Married ☐ (2) Separated / Divorced / Widow ☐

6-Academic Qualification: (1) Illiterate ☐ (2) Primary ☐ (3) Secondary ☐

(4) Intermediate ☐ (5) Graduation or above ☐

7-No of Children:

(1) 1-3 ☐ (2) 4-6 ☐ (3) 7 or Above ☐

8-No of Adult Households:

(1) 1-4 ☐ (2) 5-8 ☐ (3) 9 & Above ☐

II-MATERNAL BEHAVIOUR

S. #	Knowledge	Yes (1)	No (2)
1	Do you know what folic acid is?	1	2
2	Do you know the importance of folic acid in pregnancy?	1	2
3	Do you know food containing folic acids?	1	2
4	Do you know folic acid deficiency may cause Anaemia, Mouth ulcers and Poor growth?	1	2
5	Do you know the critical time during pregnancy when folic acid supplements are more important?	1	2
6	Do you know Neural tube defects and anaemia complications having because of folic acid deficiency in pregnancy?	1	2
7	Have you ever taken folic acid supplement?	1	2
8	Do you take enough folic acid from your diet by using green vegetable?	1	2
9	Did Physician/gynaecologist/Pharmacist ever recommend you taking folic acid?	1	2
10	Do you start taking folic acid before pregnancy?	1	2
11	Do you start taking folic acid within 1-3 month of pregnancy?	1	2
12	Do you start taking folic acid within 4-6 month of pregnancy?	1	2

13	You know right dosage of folic acid regarding your health/age?	1	2
14	Do you frequently supposed to take your folic acid supplement?	1	2