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Nutrition During Pregnancy in Kenya

A Focused Literature Review Based on Finland and Kenya

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Thesis abstract

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Title of thesis: Nutrition during pregnancy in Kenya: a focused literature review based on Finland and Kenya

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The objective of this thesis is to research nutrition practices during pregnancy in Kenya. The goal of this literature review is to raise awareness of the importance of nutrition during pregnancy, by comparing practices from two countries, Kenya and Finland. This thesis was conducted in collaboration with Healthy Africa project.

As a research method, a descriptive literary review was used in this thesis. A total of five sources were selected for the literature review, along with two nutrition guidelines. The material used was up-to-date studies written in English. The selected data was analyzed, and with the research question in mind, relevant information was found, from which the literature research was combined.

According to the findings, good nutrition during pregnancy is the basis for successful pregnancy, childbirth, as well as breastfeeding. Finland and Kenya have different practices, as well as cultural differences regarding nutrition during pregnancy, which is reflected in the diet of pregnant women. Health clinics for pregnant women operate in both countries; in Finland these are known as maternity clinics and in Kenya, as ANC clinics, where expectant mothers receive information about pregnancy, nutrition and practical help if necessary. The diet of the mother, especially during pregnancy, has been identified as important, especially considering that the diet should be in accordance with the recommendations for the wellbeing of the mother and satisfactory birth outcomes.

Keywords: Kenya, pregnancy, nutrition

SEINÄJOEN AMMATTIKORKEAKOULU

Opinnäytetyön tiivistelmä

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Opinnäytetyön tavoitteena oli laajentaa näkemystä raskaudenajan ravitsemuksen tärkeydestä. Opinnäytetyön tarkoituksena oli tuottaa kirjallisuuskatsauksen avulla tietoa raskaudenajan ravitsemuksesta Keniassa ja johtopäätöksissä yhdistää tähän Suomalaisia käytäntöjä. Näin raskaudenajan ravitsemuksen merkitys korostui molemmissa maissa. Opinnäytetyö tehtiin yhteistyössä Terve Afrikka projektin kanssa.

Tutkimusmenetelmänä opinnäytetyössä käytettiin kuvailevaa kirjallisuuskatsausta. Kirjallisuuskatsaukseen valittiin yhteensä viisi lähdeteosta, sekä kaksi ravitsemusohjeistusta. Käytetty aineisto oli ajantasaista, englanniksi kirjoitettuja tutkimuksia. Valittu aineisto analysoitiin ja tutkimuskysymystä miettien etsittiin oleelliset tiedot, joista kirjallisuuskatsaus koottiin.

Tutkimustulosten mukaan hyvä raskauden aikainen ravitsemus on pohja onnistuneelle raskaudelle, synnytykselle, sekä imetykselle. Suomella ja Kenialla on erilaisia käytänteitä, sekä kulttuurisia eroja raskauden ajan ravitsemuksen suhteen, joka näkyy raskaana olevien naisten ruokavaliossa. Molemmissa maissa toimii raskaana oleville naisille terveysklinikoita, Suomessa neuvoloiden ja Keniassa ANC klinikoiden muodossa, jossa odottava äiti saa tietoa raskauden aikaisesta ravitsemuksesta ja käytännön apua tarvittaessa. Äidin ruokavalio raskauden aikana todettiin tärkeäksi. Suositusten mukainen raskaudenaikainen ravitsemus oli merkityksellinen sekä äidin että sikiön terveydelle, niin Keniassa kuin Suomessakin, kulttuuritekijöistä ja olosuhteiden eroista huolimatta.

Avainsanat: Kenia, raskaus, ravitsemus

CONTENT

Thesis abstract 2
Opinnäytetyön tiivistelmä 3
CONTENT 4
Tables, Figures and Pictures 5
Terms and Abbreviations 6
1 Introduction 7
2 Nutrition During Pregnancy 8
2.1 Nutrition 8
2.2 Pregnancy 9
2.3 Nutrition during pregnancy 10
2.3.1 Nutrition during pregnancy in Finland 11
2.3.2 Positive aspects related to nutrition during pregnancy in Finland 11
2.3.3 Challenges related to nutrition during pregnancy in Finland 13
3 Implementation of the Thesis 16
3.1 Goal and purpose of the Thesis 16
3.2 Literature review 16
3.3 Data collection and selection 17
3.4 Analysis 18
3.5 Ethicality and reliability of the study 18
4 Results of the Study 19
4.1 Nutrition during pregnancy in Kenya 19
4.2 Positive findings related to nutrition during pregnancy in Kenya 20
4.3 Challenges related to nutrition during pregnancy in Kenya 22
5 Conclusion 25
6 Bibliography 29
7 Bibliography for Literature Reviw 31
8 Literature Review Results 33

Tables, Figures and Pictures

Figure 1. The selection process of research articles for review……18

Table 1. Literature review results……33

Terms and Abbreviations

Adult-onset Diabetes	Type 2 diabetes.
ANC clinic	Antenatal care clinic. Provide resources to improve nutrition, health knowledge and health promotion in Kenya.
BMI	Body Mass Index.
C-section	Surgical procedure. Baby is delivered through incisions in the abdomen and uterus.
Gestational Diabetes	High blood sugar, which develops during pregnancy. Usually disappears after giving birth.
PCOS	Polycystic ovary syndrome.
Post-natal	Women that had a child less than one year.
Pre-eclampsia	Pregnancy complication.
STM	Finnish Ministry of Social Affairs and Health.
Duodecim	Finnish health library database.
THL	Terveyden ja hyvinvoinnin laitos/Finnish Institute for Health and Welfare.
WHO	World Health Organization.

1 Introduction

According to Kenyan Ministry of Health, good maternal nutrition is the foundation for a successful outcome of pregnancy, child delivery and lactation (National Guidelines for Healthy Diets and Physical Activity 2017). Thus, maternal diet, especially during pregnancy, has been stated critical seeing that the diet should be confronted with the nutrient recommendations for the wellbeing of the mother and satisfactory birth outcomes (Kiboi, Kimiywe & Chege 2016). Maternal nutrition comprehends the nutrition before and during pregnancy and lactation (National Guidelines for Healthy Diets and Physical Activity 2017). Kiboi *et al.,* (2016), states that research studies have clearly shown the connection with diverse diet and nutrient adequacy resulting in better maternal nutritional status among pregnant women.

When observing nutritional differences and similarities during pregnancy, understanding versatile practices and food beliefs is critical. These aspects need to be taken into consideration when regenerating dietary recommendations, nutritional programs, and educational messages (Riang'a, Broerse & Nangulu 2017 b). Diets and eating habits are influenced by various factors but, after all, the standard principles of healthy eating remain constant (National Guidelines for Healthy Diets and Physical Activity 2017).

The objective of this thesis is to research nutrition practices during pregnancy in Kenya. The goal of this literature review is to raise awareness of the importance of nutrition during pregnancy by comparing practices from two countries, Kenya and Finland.

2 Nutrition During Pregnancy

2.1 Nutrition

The Webster dictionary defines nutrition as ‘the act or process of nourishing or being nourished’ (Merriam Webster 2019). In other words, it is the process where a person utilizes food substances that it takes in. Nutrition is a crucial component in health and development. According to World Health Organization (WHO), better nutrition is associated to improved infant, child and maternal health, a stronger immune system, safer pregnancy and childbirth, lower risk of non-communicable diseases and durability (WHO 2019 a).

The Department of Nutrition for Health and Development, in cooperation with Food and Agriculture Organization, continually reviews new research and information from human nutrient requirements and recommended nutrient intakes from around the world (WHO 2019 b). Many countries rely and use these research data as their standards to develop dietary guidelines for their population (WHO 2019 b). The aim of these nutrient recommendations is to improve national health through nutrition.

When observing nutrition recommendations from the Finnish national nutrition consulting committee (2014), it is claimed that the need of nutritional intake and recommended diet varies based on individuals’ state of health. These nutritional recommendations are aimed for the whole population - healthy, reasonably mobile people - but are not suitable for people whose nutritional intake need has distinctly changed (for example people with malabsorption) (Suomalaiset ravitsemussuositukset 2014).

Healthy nutrition is at best when everyday choices will affect long periods of time, and consequently, it is necessary to safeguard the adequate and versatile nutrients for a balanced diet. A balanced diet consists of adequate amounts of fat, carbohydrates, proteins, vitamins and minerals (Suomalaiset ravitsemussuositukset 2014).

2.2 Pregnancy

Pregnancy is a state, which results when sperm fertilizes an egg released from the ovary during ovulation. From this egg, the fetus starts to evolve into a human baby over the next 9 months. An average pregnancy lasts 280 days. The pregnancy can be detected 10 days after missing the periods with most women. Blood tests, checking fetus's heartrate or X-ray can also be used to check the pregnancy, as well as the home pregnancy tests (Cherney 2019).

During pregnancy, the expecting mother's body goes through changes, both physical and emotional. These changes usually occur in certain trimesters of the pregnancy. The trimesters are the first trimester weeks 1-12, the second trimester weeks 13-17, and the third trimester weeks 18-40. Nausea, tiredness, breast growth, breast soreness, increased need to urinate and abdominal pain are usual changes, which a pregnant woman can feel during this state (Terveyskylä 2019 a). Emotionally, the first trimester can also be challenging for expecting mothers. Even though the changes in the body are not visible yet, a mother can already worry about the health of the fetus and emotions can change quickly about the fetus. Mothers who are pregnant for the first time, usually feel these emotions even stronger, compared to those mothers who already have gone through pregnancy before (Terveyskylä 2019 a). It is important to remember that a healthy lifestyle, rest and exercise help the mother to secure her own health during pregnancy and create the best possible circumstances for the fetus's growth.

The second trimester is usually easier for the mother in a physical way. Even though the stomach starts to grow, and the mother starts to gain weight, the nausea and tiredness from earlier pregnancy decline. It is recommended to exercise normally during pregnancy, and the exercise cannot affect the fetus's health. Good physical health also relieves back pain, increases mood and improves sleep (Terveyskylä 2019 a). The fetus also starts moving during this trimester, and the mother can feel the baby moving and kicking inside the uterus. Emotionally, the second trimester can be quite dividing. On one side, the mother can feel extremely happy and excited about the new member in the family, but on the other hand, the possible fears about the baby's safety and fear of the labor can even make the mother feel negatively

about the baby. This stage of pregnancy also unites the mother and the father, when they start to prepare for the new family member (Terveyskylä 2019 a).

The last phase of the pregnancy, the third trimester, is the time when the mother starts to prepare for the motherhood and labor. Physically, the fetus grows greatly inside the uterus, which creates problems with the mothers' physical state and adds limitations. The mother's body can be a bit clumsy, and pain can increase, especially back pain and discomfort in the pelvic area. During the third trimester, the fetus already has all the needed body functions to survive outside of the uterus (Terveyskylä 2019 a). Emotionally, the mother already prepares to the labor and meeting her newborn baby. It is normal that the mother feels restless and gets tired of pregnancy, this is a normal state, in which mother's mind is ready for the labor. Physically, this state is known as the detaching phase (Terveyskylä 2019 a). The last phase of the 3rd trimester in the labor. For mothers who are giving birth for the first time, labor usually starts when the mother has had contractions going on for two hours and at least one occurs every five minutes, which also lasts for at least one minute. Mothers who already have given birth before, will have contractions for one hour every ten minutes and one contraction lasts at least one minute. Overall labors can start slowly, and contractions can even increase and decrease over time (Terveyskylä 2019 a). In the end, pregnancy is a challenging and new point in women's life. Every woman can feel it differently, and all pregnancies are different and unique.

2.3 Nutrition during pregnancy

The aim in nutrition during pregnancy is the unborn baby's growth and development, likewise safeguarding mothers' wellbeing (THL 2019 a). According to Riang'a, Nangulu & Broerse (2017 a), maternal nutrition has a significant influence on women's health, pregnancy outcome and child survival. Safe and versatile pregnancy time nutrition is an essential part in the health and development of the fetus, as well as providing a better health condition for the mother (Kiboi *et al.,* 2016).

During pregnancy, one of the most important things that mothers need to pay attention to is weight control. Normally during pregnancy, mothers' weight grows 8-15kg

during the whole 9 months (Duodecim 2018). In general, overweight is considered as a challenge during pregnancy in developing countries (Heino *et al.,* 2018), and when considering this information related to low- and middle-income countries, the challenge is malnutrition (Riang'a *et al.,* 2017 b).

Countries have specialized maternal health care services and clinics. The goal of these clinics is to guide and assist pregnant mothers during the pregnancy time and care for their medical needs, which can lead to reduction of maternal mortality and fetal mortality.

2.3.1 Nutrition during pregnancy in Finland

During pregnancy, the overall goal is safeguarding the growth and development of the fetus, as well as the safety of the mother (THL 2019 a). Pregnancy can be a good chance for the family to inspect and change their eating habits, so they can create the best possible start for their new family member. In Finland, there are many healthy food choices mothers can choose their meal from, and they can get instructions from maternity clinics.

In Finland, a proper pregnancy diet contains vegetables, fruits, berries, wholegrain products, vegetable oil, vegetable oil-based margarine, fish, low-fat meat and fat free milk products. All these suggestions are guided by professionals at maternity clinics, face to face with clients. Information is also quite easy to find from Finnish websites, such as THL (Finnish Institute for Health and Welfare) or Duodecim (Health library database), as well as in booklet forms, which can be found from maternity clinics. Unfortunately, there are not many studies examining diets during pregnancy in Finland. Still, it is reported that the main energy source within the diet during the pregnancy were cereals and milk products (Arkkola 2009).

2.3.2 Positive aspects related to nutrition during pregnancy in Finland

According to Hakulinen *et al.,* (2019), women who have a versatile diet and who are otherwise healthy, do not need to change their diet during pregnancy. In Finland,

this is normally the case within the pregnant women, since eating habits tend to be versatile in most cases. A well-balanced and healthy diet during pregnancy is safeguarding the growth and evolution of the fetus, speeds up recovery from labor, and supports breastfeeding.

One of the most important things that Finland has to offer for pregnant women is the maternity clinics. Health care workers in maternity clinics use information obtained from organizations such as THL and STM (Finnish Ministry of Social Affairs and Health). Pregnant women are guided to go nine times to the maternity clinic during their pregnancy time, to safeguard the health of the fetus and the mother. In addition, these visits to the clinic promote the well-being of the future parents and provide guidance, so the newborn baby will have a safe environment for the future. The overall goal is to advise on public health and prevent any kind of trouble that might occur during the pregnancy period (THL 2019 c). Healthcare workers at the maternity clinics, such as doctors, public health nurses and midwives, have an important work, in which they must be able to guide the becoming parents, and take care of any possible health problems that may occur. It is important to prepare the parents for the future and provide guiding tools. It is also important to make the clients feel their wishes have been heard, and their questions are being answered (THL 2019 c).

When a woman goes to the maternity clinic, one of the things that the nurse talks with the client is the importance of diet and possible changes that might be needed. The guidance can be done face-to-face with the client, or through different dietary booklets, which can be found from the clinics. During the pregnancy period, mothers are supposed to follow the normal food recommendations for pregnant women. According to Duodecim (2019 a), special care and guidance is given to women who are undernourished, have one-sided diet, have special diet or are overweight. The diet is evaluated by checking weight gain, hemoglobin and overall health. The cornerstone of a good diet in Finland consists of full grain products, vegetables, berries and fruits. Meat, fish and milk products bring balance to the diet (Duodecim 2019 a).

Dietary supplements may also be used during pregnancy in Finland. A vitamin-D supplement is recommended for every expecting mother, as well as breastfeeding

mothers. Pregnancy creates a need for vitamin-D, as well as wintertime in Finland. Folic acid supplement is also recommended, when planning the pregnancy and for the beginning of pregnancy (Duodecim 2019 a). Iron and calcium supplements are recommended to some mothers. One out of three expecting mothers have iron deficiency, and for them iron supplements are needed. Calcium supplements are needed if the diet is not able to secure it. The required amount of calcium can be achieved with 6dl of milk products, or few slices of cheese. Supplements might be needed with mothers who are lactose intolerant or vegans (Duodecim 2019 a). There are many possibilities for supplements in Finland, and the needs of every mother is considered individually.

Overall, the situation in Finland is well controlled when it comes to the dietary needs of pregnant women. The normal Finnish diet is well balanced and safe for the fetus and big changes are not needed during the pregnancy. Undernourishment is not a big concern in Finland, and there is enough food for the most people, especially for the pregnant women.

2.3.3 Challenges related to nutrition during pregnancy in Finland

The usual challenges concerning nutrition during pregnancy in Finland and in every other developed country is overweight or diabetes (Heino *et al.,* 2018). According to Heino *et al.,* (2018), the medium body mass index (BMI) of the pregnant Finnish women in labor was 24,8 in 2017. 37,5% of the mothers were overweight and 14,4% were obese. The information about the BMI of the women in labor has been continually followed since 2006, and during that time the percentage of overweight mothers has grown by 5% and obese women by 3% (Heino *et al.,* 2018).

Overall, the weight growth of women happened within all the women in Finland. Within the age group of 20-54 year-old women, about 18% were overweight in 2017. The growth of the overweight percentage can lead to problems in the future, especially when the problem is happening within the group of future pregnant women. Overweight before pregnancy leads to bigger chance of gestational diabetes and pre-eclampsia. Overweight women in labor are also more likely to go through c-section, which can be a slight problem, because recovery from surgeries usually is

slower for overweight people. The chances of wound or womb inflammations are more likely to happen within the overweight group, when compared to normal weight group (Heino *et al.,* 2018).

During pregnancy, it is recommended to monitor weight. The normal weight gain during the pregnancy is around 8-15kg (Duodecim 2018 a). If weight gain is slow, it can be a sign of slow growth of the fetus, and continual excessive weight can wear out the mother's body. Too fast increasing weight can be 500g per week for normal sized women. This can lead to abnormal swelling from liquids gathering in the body (Hakulinen *et al.,* 2019). Overweight during pregnancy can predispose the woman to overweight, gestational diabetes or even adult-onset diabetes after the pregnancy (Hakulinen *et al.,* 2019).

The amount of gestational diabetes patients has increased in Finland during the last few years, according to Duodecim (2019 b). 19% of the women in labor had abnormal result when testing and for 15,6% gestational diabetes was diagnosed (Terveyskirjasto 2019 b). Risk factors leading to gestational diabetes are overweight of the mother before pregnancy, polycystic ovary syndrome (PCOS), age over 40 or gestational diabetes in earlier pregnancy. Risk factors during pregnancy are sugar findings from the morning urine or suspicion of large fetus. The most usual reason for gestational diabetes is the lack of insulin productions in mothers' body. The increased need for insulin is not answered, which leads to an increase in blood sugar level in mothers' blood and fetus's blood, since sugar can easily travel through the placenta (Terveyskylä 2019 b). High blood sugar levels during pregnancy create a risk for the newborn in the way that the baby has low blood sugar levels, which need follow up or special treatment. In addition, there is an increased risk for metabolic syndrome. For the mother, the risk of higher blood pressure or pre-eclampsia is increased (Terveyskylä 2019 b).

When it comes to diet recommendations for pregnant women, according to Arkkola (2009), pregnant women in Finland are not eating enough vegetables, fruits, berries or fish. Based on Arkkola (2009), it was seen that the food choices were closer to the recommendations with higher educated women, compared to low educated women. Fiber and vitamins consumption were especially more usual within the higher educated group, as well as fat consumption. For developing fetus, the fatty

acid is needed for the development of the nervous system, sight and endocrine system. Unfortunately, the gain of the good fatty acids is under the recommendations with most of the Finnish women (THL 2019 a). Another challenge is the usage of too much hard fats, which can weaken the sugar tolerance of the body. Hard fats can be found in butter, fatty milk products, fatty meat, pastry's, cookies and coconut oil, all these products should be avoided during pregnancy (THL 2019 a).

Socio-demographic factors also affect the pregnancy time diet. Normally, young, low educated and smoking mothers are the ones who need the most guidance from maternity clinics, according to the Finnish Institute for Health and Welfare (THL 2019 a). The difference of using dietary supplements during pregnancy can also be seen in socio-demographic status. Normally, women who use these supplements are highly educated, who already have a diet close to the nutrition recommendations (Arkkola 2009).

One of the Finnish thoughts that can be heard during pregnancy is that the mother should be eating for two, since she is pregnant. This is not a fact that should be followed. During the first three months, the need for nutrition is not increasing and even after this stage, the extra energy needed can be found e.g. from one sandwich, glass of milk and a fruit (Hakulinen *et al.,* 2019). Instead of eating more than before, it is more important to eat versatile food and often enough.

3 Implementation of the Thesis

3.1 Goal and purpose of the Thesis

The aim of this thesis is to research nutrition practices during pregnancy in Kenya. The goal of this literature review is to raise awareness of the importance of nutrition during pregnancy by comparing practices from two countries, Kenya and Finland. By this thesis, we searched answers to the following research questions:

1. What are the positive findings about nutrition during pregnancy in Kenya?
2. What are the challenges in nutrition during pregnancy in Kenya?

3.2 Literature review

Literature review is a method and research technique, where research is being studied and examined (Salminen 2011). The aim of the literature review is to evolve theory that already exists and build a new theory based on this (Salminen 2011). The literature is composed of research process, incorporating a defined research question, which is then answered using a pre-defined methodology involving searching for relevant literature, appraising and evaluating literature, and combining the results (Aveyard 2014). There are many approaches and types of literature reviews that can be roughly divided into three different types, which are descriptive literature review, systematic literature review, and meta-analysis, which is then divided into qualitative and quantitative (Salminen 2011).

A descriptive literature review was used for this thesis. Descriptive literature review is the most common type of literature review, which can be characterized as an overview without strict and exact rules. The searched literature is broad, and thus selection of the literature is not limited with methodical regulations (Salminen 2011). The phenomenon that is being researched can be described comprehensively and if necessary, categorized according to the examined qualities of the phenomenon (Salminen 2011).

3.3 Data collection and selection

This literature review included three processes: search, selection and analysis of the data. When searching for relevant articles, certain search engines were used, Google Scholar, Finna, PubMed and Cinahl databases. Data was searched by using the search words: Kenya, pregnancy and nutrition, and by using combinations; Kenya and pregnancy, pregnant women, nutrition intake. These terms were decided based on our discussions highlighting the research questions. To limit the search to most relevant and up to date articles and guidelines, only literature that was published between 2009 and 2019 was used. The authors decided also to limit the language of the selected articles to English. Considering these rules and limitations, 25 articles were retrieved. Since the nature of the thesis, two (n=2) Kenyan national guidelines were suggested by our 2nd supervising professor Florence Habwe from Maseno University, Kenya.

Two steps were taken to select the most relevant articles (see Fig. 1). First, articles had to be focused only on Kenya. These criteria resulted in eight (n=8) relevant articles and two (n=2) national Kenyan guidelines. Secondly, the abstract had to pertain at least two of the chosen research words or combinations. This resulted in five (n=5) relevant articles and two (n=2) national Kenyan guidelines.

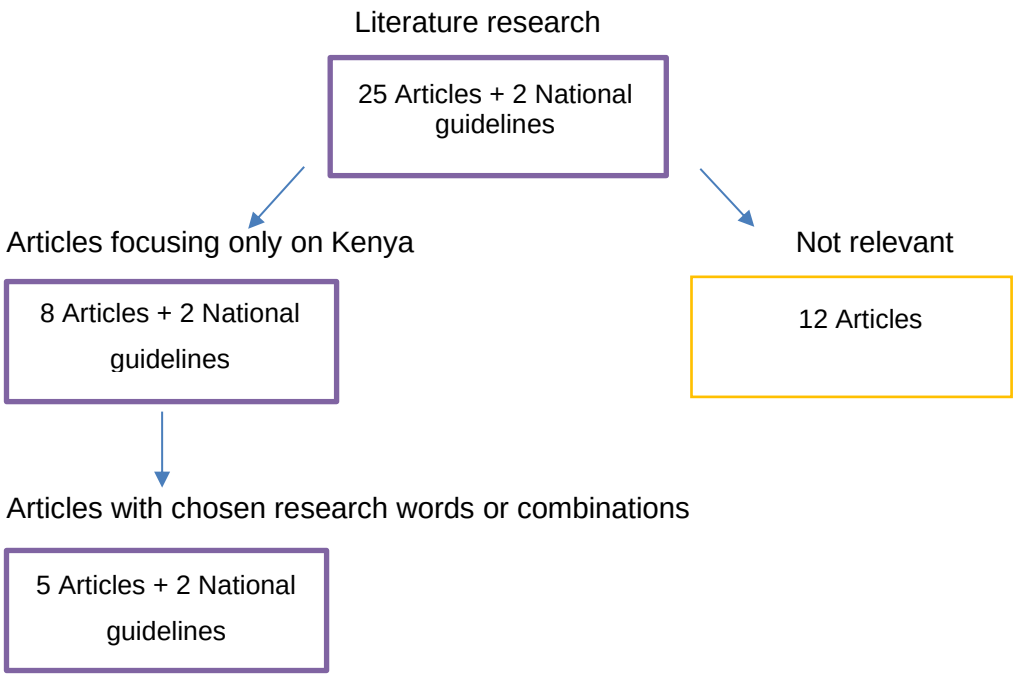

Figure 1. The selection process of research articles for review.

3.4 Analysis

The data of the study were analyzed using conventional content analysis (Hsieh & Shannon 2005). The analysis was done in three steps. First, we read the articles thoroughly. Secondly, we highlighted with colors relevant parts from the text related to pregnancy, nutrition, information sharing, and culture. The analysis continued by comparing the articles, and by classifying the highlighted parts into three categories (Krippendorff 2004). These categories were information, pregnancy, and nutrition. Thirdly, through classified analysis we searched answers to our research questions. Thus, the main results are presented by following the research questions.

3.5 Ethicality and reliability of the study

Data was collected from trustworthy scientific journals and research articles, which have been confirmed to be ethically credible. Authors behind sources were acknowledged after every use of their citations, as well as in bibliography, to make sure that plagiarism was avoided.

Reliability of the thesis was assured by using reliable sources, as well as using only articles that were up to date, from 2009 to 2019. The whole thesis project was written according to university principles and meetings with tutor teachers were arranged, thus ensuring a correct way of implementing the literature review.

4 Results of the Study

4.1 Nutrition during pregnancy in Kenya

Divergent and multiple factors, such as the location of the residential area, type and amount of food availability, individual needs, beliefs and taboos about food substances, income, socio-economical level, educational level and information about nutrition, influence the eating customs and diets of individuals and their families, as well their communities in Kenya (National Guidelines for Healthy Diets and Physical Activity 2017). These complex factors need to be taken into consideration when observing the nutrition from a point of view of pregnant women in Kenya.

According to Riang'a *et al.,* (2017 b), there are 42 ethnic groups in Kenya with various and changing nutritional traditions and taboos. These taboos and traditions are mainly maintained to protect the health of the mother and the baby, but also to ensure successful pregnancy outcomes (Riang'a *et al.,* 2017 b). Some of these food taboos and traditions have long roots in the history of Kenya, and the community might not even know or be aware of the possible arguments behind them (Kariuki *et al.,* 2017). Furthermore, only few studies have been done concentrating on the connection between pregnancy, culture and nutrition (Riang'a *et al.,* 2017 b). Thus, cultural taboos and beliefs have not been scientifically studied or proved to be safe for the mother and child. The traditional way of believing cultural taboos and beliefs has a negative impact on the outcome of malnutrition relief effort and prevention interventions concerning pregnant women (Riang'a *et al.,* 2017 b). These beliefs and practices are mainly transmitted among women in the family, by grandmothers, mothers, mothers-in-law, other older female relatives, friends and neighbors (Riang'a *et al.,* 2017 b).

Only the pregnant women having certain health problems, such as low hemoglobin status, low weight increase or HIV positive, reached knowledge and information of healthcare practitioners (Riang'a *et al.,* 2017 b). Furthermore, the study of Perumal *et al.,* (2013), has shown that pregnant women, who attended for antenatal care (ANC) clinics to receive malaria and anthelmintic practices, had higher health

knowledge than those pregnant women who did not attend. According to the WHO, at least four antenatal visits for women with low-risk pregnancy is recommended (Perumal *et al.,* 2013). ANC is a key strategy to decrease maternal mortality in low resource settings (Perumal *et al.,* 2013). Thus, ANC clinics are key entry-points in rural areas in Kenya for implementing nutrition and health education interventions to promote preventive health behaviors among pregnant women, through better knowledge, attitudes and practices (Perumal *et al.,* 2013).

Implementation of programs about health and nutrition counselling are considered vital in order to guarantee effective uptake of health and nutrition knowledge and improvement in food and dietary practices (Perumal *et al.,* 2013). Therefore, the Kenyan government has put into practice several policy measures, which focus on food security in the country (Riang'a *et al.,* 2017 a; National Guidelines for Healthy Diets and Physical Activity 2017). One of the policy interventions is called the National Food Security and Nutrition Policy (NFSNP) 2009. One of its main objectives is to 'increase the quantity and quality of food available, accessible and affordable to all Kenyans at all times, and to achieve good nutrition for optimum health of all Kenyans, women and children included' (Riang'a *et al.,* 2017 a, p. 2).

4.2 Positive findings related to nutrition during pregnancy in Kenya

According to a group of pregnant and post-natal (with children less than one year) Kenyan women, childbearing is very important, since it is the most usual way to gain security, acceptance and identity inside the family and in the community (Riang'a *et al.,* 2017 b). That is, children compose the most significant visible sign of prosper and accomplishment in society for the husband and wife (Riang'a *et al.,* 2017 b).

In order to avoid 'any calamity that might interfere with pregnancy and childbirth', some food ingredients are restricted or encouraged to be consumed during pregnancy (Riang'a *et al.,* 2017 b, p.12). These cultural food beliefs, both positive or negative, are widely known and practiced among Kenyan women (Riang'a *et al.,* 2017 b). However, food substances and practices vary between different parts of Kenya and even inside tribes (Riang'a *et al.,* 2017 b). In Riang'a *et al.,* (2017 a)

study, a group of pregnant and post-natal Kenyan women mentioned multiple reasons for following these food practices and taboos, in order to avoid certain health threating conditions. Women's perceived health threats were abstracted labour (to have a big baby and/or lack of maternal strength during the birth), hemorrhage (low blood amount in the body), and disease/complications of mother and/or baby (consuming evil or bad food) (Riang'a *et al.,* 2017 a).

The belief of giving birth to a big baby - baby becoming too big - was common fear among pregnant women, and one of the reasons why they were advised to reduce some of the food substances that have many calories (energy) and protein or starch (Riang'a *et al*., 2017 a; Kariuki *et al*., 2017). From a scientific point of view, food substances that are consumed more than needed, will be converted and stored as fat in the body, and this might lead to weight gain and obesity (Riang'a *et al.,* 2017 a). However, these advised restrictions aiming to reduce some of the food substances do not specify how much should be consumed (Riang'a *et al.,* 2017 b). The restrictions related to food rich in energy is a complex issue, since malnutrition is common in Kenya (Riang'a *et al.,* 2017 a). According to WHO, healthy women should gain 10 to 14 kg during pregnancy (Kenya National Clinical Nutrition and Dietetics Reference Manual 2010).

Research (Riang'a *et al*., 2017 b) has shown that pregnant women believed that porridge, ugali, potatoes, milk and traditional vegetables are associated with providing strength and strong body, which will prevent complications during the labor. It is believed that a weak woman will have fatigue and is not able to cope in labor (Riang'a *et al*., 2017 b). Riang'a *et al.,* (2017 a), state that these beliefs are true since the weight of the woman increases, the body mass ratio and body metabolic reactions also increase, therefore demanding more energy.

Spinach, liver, animal's blood, red beans, fish and the native vegetables are believed to increase the amount of blood (Riang'a *et al.,* 2017 b). These food substances are rich in iron, which affects the hemoglobin levels and prevent pregnant women from having anemia (Riang'a *et al.,* 2017 a). Furthermore, according to Kiboi *et al.,* (2016), pregnant women's intake of protein, carbohydrate, and vitamin C was found to be adequate.

Alcohol consumption and cigarette smoking is restricted among pregnant women in certain ethnic groups, states Riang'a *et al.* (2017 a) and Riang'a *et al.* (2017 b). These substances are believed to cause damage and disabilities to the developing fetus in the uterus or later in life. Research has shown that this knowledge is accurate (Riang'a *et al.,* 2017 a; Riang'a *et al.,* 2017 b). In addition, Kenyan National Guidelines for Healthy Diets and Physical Activity (2017), recommends in their guideline not to take dangerous substances, such as alcohol, illegal drugs, non-prescribed medicines or supplements during pregnancy.

Kenyan National Guidelines for Healthy Diets and Physical Activity (2017 p.1), indicate 'key messages to assist the general Kenyan population in following nutrition and health recommendations'. The guideline contains six key messages for pregnant women to adhere to a healthy diet. A variety of foods from different food groups are recommended to provide energy and nutrients, such as liver, red meat, fresh vegetables, fruits and cheese, also 60mg of iron and 400 µg folic acid supplementation are recommended as daily (The National Guidelines for Healthy Diets and Physical Activity 2017). The guideline encourages pregnant women to contact the health clinic and seek nutrition counselling to help them address common food-related problems, which may develop during pregnancy (The National Guidelines for Healthy Diets and Physical Activity 2017).

4.3 Challenges related to nutrition during pregnancy in Kenya

Malnourishment is a challenge in low- and middle-income countries (Riang'a *et al.,* 2017 a). Kiboi *et al.,* (2016), found in their study that 19,3% from 254 pregnant women who attended ANC clinic were undernourished. Malnourishment during pregnancy creates greater risks of having a complicated delivery, which can lead to mortality due to post-partum hemorrhage (Riang'a *et al*., 2017 a). Furthermore, stillbirths, miscarriages, intrauterine growth retardation and low birth weight are linked to poor maternal nutrition during pregnancy (Riang'a *et al*., 2017 a; Riang'a et al., 2017 b). This kind of challenges related to pregnancy may cause children to be born as stunted and, furthermore, these children born are facing themselves greater risk

of giving birth to stunted children (Riang'a *et al.,* 2017 a). This kind of process leads to a cycle of nutritional problems (Riang'a *et al.,* 2017 a).

The dietary diversity was found to be generally good in the diets of pregnant women (Kiboi *et al.,* 2016). Despite this, inadequate intake of both macro- and micronutrients was stated among pregnant women due to insufficient quantities of foods that were used (Kiboi *et al.,* 2016). Diversity of diet is defined according to Kiboi *et al.,* (2016, p.378), 'as the amount of different food groups or foods that are consumed over a specific reference period'. Nutrient adequacy has been demonstrated through scientific evidence to be strongly associated with dietary diversity (Kiboi *et al.,* 2016). Hence, the variety of food substances in the diet is important to ensure the adequate intake of vital nutrients and realizing an optimal nutritional status (Kiboi *et al.,* 2016).

Insufficient food sources, seasonal fluctuations and unequal distribution of food influence Sub-Saharan African individual's nutrition inadequacy (Kariuki *et al.,* 2017). Unequal distribution of the food is not merely on society level, but also it can be seen inside the household, as expectations that women eat less or serve the other members of the household first (Kariuki *et al.,* 2017). Furthermore, pregnant and lactating women have cultural taboos and practices which they need to follow, leading to nutritional challenges (Kariuki *et al.,* 2017; Riang'a *et al.,* 2017 b). This influences women's micronutrient deficiencies, especially vitamin A, folate, iodine, iron, calcium and zinc (Kariuki *et al.,* 2017). The mean contribution of fats (18,72% of recommended 20-30%) and intake of energy and folic acid was also inadequate based on a study from Kiboi *et al.,* (2016). It is stated that adverse health outcomes in pregnancy are linked with vitamin and mineral deficiency (Kariuki *et al.,* 2017). Pregnant women need higher amount of iron since it affects fetal growth (Kariuki *et al.,* 2017). Due to iron deficiency, pregnant women may become anemic and this formulates an increased risk of maternal mortality and preterm birth (Berti *et al.,* 2011).

In Riang'a *et al.* (2017 a, p.8), research was stated that 'pregnancy and childbirth is considered to be a health threat in the sense that the pregnancy may end up with the death of the fetus, the woman and/or her newborn baby'. The fear of death during pregnancy make women to believe in different dietary precautions and beliefs to avoid complicated delivery, maternal death and stillbirths (Riang'a *et al.,* 2017 a).

Maternal mortality rate in Kenya is 488 maternal deaths per 100 000 live births (Riang'a *et al.,* 2017 a).

5 Conclusion

The aim of this thesis was to study Kenya's nutrition practices during pregnancy. The goal of this literature review was to raise awareness of the importance of nutrition during pregnancy by comparing practices from two countries, Kenya and Finland. In this conclusion section, we consider the results and compare them to Finnish practices. Kenya and Finland differ both culturally and geographically, which makes a great difference to the eating habits of pregnant women.

Divergent and multiple factors, such as the location of the residential are, type and amount of food availability, beliefs about food substances, income, socioeconomic level, educational level and information about nutrition influence the eating customs and diets of individuals and their families, as well as communities in Kenya. These complex factors need to be taken into consideration when observing nutrition from the point of view of pregnant women in Kenya and Finland.

Kenya has strong cultural beliefs, which are obtained from the elders of the community. When observing the diet of a pregnant woman in Kenya, cultural beliefs have a bigger impact on the food substances to be consumed during their pregnancy than in Finland. In Kenya, it is common to get advice on practices concerning pregnancy, obtained from the elder women of the community. In Finland, the pregnancy time advice and practices are mainly obtained from maternity clinics, which use information from organizations such as The Finnish Institute for Health and Welfare (THL) and Finnish Ministry of Social Affairs and Health (STM).

Pregnant women are guided to go for multiple health checkup's during their pregnancy to safeguard the health of the fetus and the mother. In Finland, the amount of maternity clinic visits provided are nine times during the pregnancy, and in Kenya mothers are provided to go to antenatal care (ANC) clinics at least four times during the pregnancy. The main objective of these visits is to provide knowledge, information and prevent any kind of troubles that might occur during the pregnancy period. Mothers are not obligated to take part in these visits, which can be seen as gaps in nutritional knowledge during pregnancy in both countries.

When observing social-demographic matters in pregnancy time, it is more usual to Finnish and Kenyan women who are low educated to need more guidance from professionals during pregnancy. The same result can be seen from the usage of dietary supplements, since highly educated women tend to use the supplements and their diet is usually closer to the recommendations.

Diet is one of the most important parts of pregnancy. The nutrition that mother and fetus obtain from food needs to be versatile and healthy, so the fetus can have enough nutrition to grow and develop. Maternal time nutrition can affect mother's health, outcome of the pregnancy, and child's survival. This is the reason why good nutrition is important during pregnancy, and pregnancy time can offer a good chance for the family to inspect and change eating habits, if needed.

There are quite a few differences within the maternity diets between Kenya and Finland. Firstly, we can talk about some of the beliefs that occur in these two countries when it comes to pregnancy and diets. In Kenya, women are advised to leave out high caloric foods, as well as protein rich foods from their diet. The reason behind this is a belief and fear that fetus might grow too big, which can make labor more painful and more dangerous. Compared to Finland, this belief is quite opposite. Normally, pregnant women can hear advice suggesting that they should eat for two, since they are pregnant. Neither of these are right. Eating too much or leaving out recommended nutrients can affect the health of the fetus and the mother in many ways, for example, the baby can be underweight when born, or the mother can have a risk for gestational diabetes.

When it comes to challenges concerning nutrition in these two countries, the problems are quite opposite. These challenges can happen due to many different reasons, for example geographical location. In Kenya, location can affect in a way that insufficient food sources, seasonal fluctuations and unequal distribution of food influence individual's nutrition inadequacy. All this can lead to malnourishment or lack of vitamins for the mother, which can affect the fetus development and growth. In Finland, problems usually occur due to mothers’ overweight or unhealthy diet. About 1/3 of mothers were overweight and 14,4% were obese. This is a problem for mother and fetus, since overweight can result in gestational diabetes or pre-eclampsia,

which can slow down the growth of the fetus. Finnish mothers also tend to eat in an unhealthy way, thus their diets have a lack of vegetables and good fatty acids.

Healthy maternal diets are shared in both countries by their governments to assist pregnant women. In Kenyan guidelines, six key messages can be found to guide women towards a healthier diet during pregnancy. Many various foods from different food groups are recommended, thus the mother gets all the energy and nutrients that is needed, such as liver, red meat, vegetables, fruits and cheese. Also, supplements of iron and folic acid are recommended for daily use. In these guidelines, pregnant women are also advised to visit health clinics for nutritional counseling for advices and help. This can be seen similar to the Finnish recommendations. Normally in Finland, the recommended diet during pregnancy contains vegetables, fruits, berries, wholegrain products, vegetable oil, vegetable oil-based margarine, fish, low-fat meat and fat free milk products. The dietary supplement recommendations are also similar. Folic acid and iron are recommended, but the difference is that Finnish mothers also need more Vitamin-D due to the lack of sun during winter. Lastly, the guidelines from these two countries also share the same recommendations about the dangerous substances, such as alcohol, drugs and non-prescribed medicines or supplements: these are not recommended during the pregnancy.

Childbearing is in Kenya very important, since it will bring acceptance and identity inside the family and in the community. Children compose the most significant visible sign of prosperity and accomplishment in society for the husband and wife. In Kenya, interventions to improve pregnant women’s nutritional status should start before pregnancy, during the lifecycle of the women herself. Since different health concerns of the mother affect directly to the fetus, women at all life stages need to adjust diet and physical activity to obtain the desirable weight and health for better birth outcomes in the future. Thus, a greater emphasis on program implementation regarding nutrition counselling and issues (e.g. information) related to pregnancy are required for ensuring effective and healthy outcomes for pregnant women and their unborn children.

In Finland, birth rate is in recession, which can be seen in the population age distribution. People are more concentrated on their careers and suitable partner, and

creating a family is discovered later in life. This raises the age among women who give birth for the first time. The government of Finland has reacted towards low birth rate and wellbeing issues by generating strategies to support child positivity and community for the future Finnish families. Nevertheless, the challenges of these two countries are diverse.

6 Bibliography

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7 Bibliography for Literature Reviw

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8 Literature Review Results

Author	Name of the article	Year of the publication	Source	Result
Baraza A., Kimani A., Samburu B., Arimi C., Nabukanda C., *et al.*	Guidelines for Healthy Diets and Physical Activity 2017.	2017	Republic of Kenya, Ministry of Health	National guidelines for healthy diets
Kariuki L. W., Lambertand C., Purwestri R. C., Maundu P., & Biesalski H. K.	Role of food taboos in energy, macro and micronutrient intake of pregnant women in western Kenya.	2017	Nutrition & Food Science	'Multivariate binary logistic regression showed that participants with higher education were more likely to reach estimated average intake for energy and vitamin than women with lower education level.'
Kiboi W., Kimiywe J., & Chege P.	Dietary diversity, nutrient intake and nutritional status among pregnant women in	2016	International Journal of Health Sciences and Research	'The mean intake of energy, carbohydrate, protein, fat, zinc, iron, folate and vitamin C was inadequate, while

	Lakipia County, Kenya.			those of vitamin A and calcium were adequate.' 'In respect to nutritional status, 19.3% were undernourished based on Mid-Upper Arm Circumference (MUAC) while 16.9% were anemic based on haemoglobin levels.' 'The result further showed that dietary diversity was positively correlated with nutrient intake and nutritional status.'
Ngaruro R., Mugambi L., Samburu B., Mbugua S., Munyao N., *et al*.	Kenya National Clinical Nutrition and Dietetics Reference Manual.	2010	Republic of Kenya Ministry of Medical Services.	National Guidelines for Nutrition and Dietetics

Perumal N., Cole D. C., Ouédraogo H. Z., Sindi K., Loechl C., Low J., Levin C., Kiria C., Kurji J., & Oyunga M.	Health and nutrition knowledge, attitudes and practices of pregnant women attending and not-attending ANC clinics in Western Kenya: a cross-sectional analysis.	2013	BMC Pregnancy and Childbirth.	'Among the 979 pregnant women in the survey, 59% had attended ANC clinics while 39% had not.' 'Among women who attended ANC clinics, 82.6% received malaria and/or antihelmintic treatment, compared to 29.6% of ANC clinic non-attendees.' 'Higher number of ANC clinic visits and higher maternal education level was significantly positively associated with maternal health knowledge'
Riang'a R. M., Broerse J., & Nangulu A. K.	Food beliefs and practices among the Kalenjin pregnant women in rural Uasin	2017	Journal of Ethnobiology and Ethnomedicine.	'The reasons for observing these dietary precautions were mainly

	Gishu County, Kenya. b.			fears of big fetuses, less blood, lack of strength during birth, miscarriages or stillbirths, and maternal deaths as well as child's colic and poor skin conditions after birth.'
Riang'a R. M., Nangulu A. K., & Broerse J. E.W.	When a woman is pregnant, her grave is open": health beliefs concerning dietary practices among pregnant Kalenjin women in rural Uasin Gishu County, Kenya. a.	2017	Journal of Health, Population and Nutrition.	Pregnancy and childbirth are considered to be a health threat in the sense that the pregnancy may end up with the death of the fetus, the woman and/or her newborn baby.' 'The pregnancy food beliefs and practices are an adaptive response to these health threats, which seem to be within the

				agency of pregnant women.’

Table 1. Literature review results