

**KNOWLEDGE, ATTITUDE AND PRACTICE ON  
DIABETICRETINOPATHY OF PATIENTS ATTENDING THE  
DIABETES CLINIC AT JIMMA UNIVERSITY SPECIALIZED  
HOSPITAL, SOUTH WESTERN ETHIOPIA**

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**H58/75354/2014**

**A Dissertation Submitted to the University of Nairobi, Ophthalmology Department in  
Partial Fulfillment for the Award of Degree of Masters in Medicine (Ophthalmology)**

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## **STUDENT’S DECLARATION**

I declare that, this thesis prepared for the PARTIAL FULFILMENT of requirements for the degree of **Masters of Ophthalmology** entitled “is my original research work prepared independently with the close advice and guidance of my advisers. This thesis has not been presented in any university and all sources that I have used or quoted have been indicated and acknowledged by means of complete references.

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## ABSTRACT

**Background/Introduction:** Diabetic Retinopathy, eye complication of Diabetes, is a potentially blinding condition which has to be screened, diagnosed and managed in all diabetic patients. The knowledge regarding diabetic retinopathy differs widely from study to study: 37.1% in a population based study done in the rural part of India and 95% in a hospital based study done in Kenyatta National Hospital in Kenya. No such study had previously been done in Ethiopia, specifically in Jimma area but diabetic retinopathy prevalence has been found to be 37.8% in Ethiopia and 41.4% among patients in Jimma.

**Objective:** To determine the Knowledge, attitude and practice regarding diabetic retinopathy among diabetic patients in Jimma University Specialized Hospital and factors associated with it.

**Design:** Cross-sectional Hospital-Based study

**Study Setting:** Jimma University Specialized Hospital Out-Patient Diabetic Clinic, South Western Ethiopia

**Participants:** Patients diagnosed with diabetes mellitus by the physicians at the diabetic clinic

**Methodology:** Questionnaires were administered to 173 diabetic patients to assess their knowledge, attitude and practice in relation to Diabetic Retinopathy. Quantitative data was entered, managed and analyzed using SPSS version 20.

**Result:** Out of 173 participants, 86.1% had knowledge that Diabetes affects the eye but only 7.1% correctly named and defined Diabetic Retinopathy. 54.3% were referred to an eye doctor. 52.6% of the patients and 48.6% of the diabetic mothers had an eye examination since diagnosed with DR. Knowledge of DR and its risk factors were seen to increase the practice of eye screening. Patients had a good attitude on eye screening.

**Conclusion:** Majority of the participants knew about diabetes affecting the eye but weren't able to explain what the disease was. There is a very low knowledge of risk factors, screening and treatment of DR. There is also an unsatisfactory level of referral of patients to eye doctors and low eye examination rate.

## ACKNOWLEDGMENT

I would like to thank my supervisors Dr.Millicent Kariuki, Dr.Sheila Marco and Dr.Salome Bukachi for their enormous contribution to this work. I deeply appreciate all the guidance and support you have given me during this process. I would like express my gratitude to my sponsors, Lions Bavarian through DAAD, for funding this thesis and all their staff for always being helpful. I am also very thankful to all my lectureurs in the Department of Ophthalmology in University of Nairobi for their teachings and inputs during my entire stay. I want to acknowlegege also the staff of the Department of Ophthalmology and Internal Medicine in Jimma University Specialized Hospital for their assistance during this study.

I want to thank my fellow students in the department for their support and encouragement. We have all become like a family and were able to lean on each other and for that I am deeply grateful. To my advisor and cheerleader behind the curtain, Daniel, I thank you for all your encouragement and contribution.

To my ever so loving and supportive parents and my entire family, the pillars of my strength, the roots of my joy and pride, I owe my entire being to you. I am blessed to have you.

Temesgen.

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## **LIST OF ABBREVIATIONS**

<b>AAO</b>	American Academy of Ophthalmologists
<b>CSME</b>	Clinically Significant Macular Edema
<b>DM</b>	Diabetes Mellitus
<b>DR</b>	Diabetic Retinopathy
<b>DRS</b>	Diabetic Retinopathy Study
<b>DRVS</b>	Diabetic Retinopathy Vitrectomy Study
<b>ETDRS</b>	Early Treatment of Diabetic Retinopathy Study
<b>FA</b>	Fluorescein Angiography
<b>IDF</b>	International Diabetic Federation
<b>IVTA</b>	Intravitreal Triamcinolone Acetate
<b>JUSH</b>	Jimma University Specialized Hospital
<b>KAP</b>	Knowledge, Attitudes and Practice
<b>KNH</b>	Kenyatta National Hospital
<b>NoDR</b>	No Diabetic Retinopathy
<b>NPDR</b>	Non Proliferative Diabetic Retinopathy
<b>PDR</b>	Proliferative Diabetic Retinopathy
<b>PRP</b>	Panretinal Photocoagulation
<b>UKPDS</b>	United Kingdom Prospective Diabetes Study
<b>UON</b>	University Of Nairobi
<b>VEGF</b>	Vascular Endothelial Growth Factor

## **1.0 CHAPTER ONE: BACKGROUND**

### **1.1 Definition of Diabetes and Diabetic Retinopathy**

#### **1.1.1 Diabetes**

Diabetes is a chronic metabolic disorder in which the body fails to produce adequate insulin or use the produced insulin effectively or both. Insulin is the hormone that makes the body cells use glucose as energy. Diabetes is characterized by chronic hyperglycemia (raised blood sugar) with metabolism disturbances of carbohydrate, protein and fat. Long term hyperglycemia results in problems with blood vessels and nerves leading to complications in kidneys, heart, eyes and other systems.<sup>1,2</sup> Symptoms of diabetes include excessive excretion of urine (polyuria), thirst (polydipsia), constant hunger, weight loss, vision changes and fatigue. The current WHO diagnostic criteria for diabetes is fasting plasma glucose level of  $\geq 7.0$ mmol/l (126mg/dl) or 2-h plasma glucose level of  $\geq 11.1$ mmol/l (200mg/dl).

There are two main types of diabetes, Type I and Type II.

- **Type 1 diabetes mellitus** (T1DM), previously called ‘insulin dependent DM’ or ‘Juvenile-onset DM’, is primarily due to an autoimmune-mediated destruction of the insulin-producing pancreatic  $\beta$ -islet cells. It results in an absolute insulin deficiency and patients require exogenous insulin. Age of onset is widely accepted to be before 30 years.
- **Type 2 diabetes mellitus** (T2DM), previously called ‘non-insulin dependent diabetes’ or ‘adult onset diabetes’ is characterized by insulin resistance and/or impaired insulin secretion. Onset is widely assumed to be after 30 years of age.

**Gestational diabetes** is hyperglycaemia occurring during pregnancy.

#### **1.1.2 Diabetic Retinopathy**

Diabetic Retinopathy (DR) is a common ocular complication of diabetes resulting from changes in the microvasculature of the retina. It is progressive and potentially sight threatening disease, occurring in both Type I and Type II Diabetes.<sup>3,4</sup> Microaneurysms, haemorrhages, hard exudates, cotton wool spots, intraretinal microvascular abnormalities (IRMA), venous beading, new vessels and fibrous tissue comprise the clinical features of the microvascular changes of DR. It is not the specificity of the lesions, rather the pattern and progression of these changes that characterize diabetic retinopathy. If not timely managed, DR can result in visual impairment, even blindness.

## **1.2 Epidemiology of DM and DR**

### **1.2.1 Diabetes**

According to the recent estimates by IDF, 382 million people live with diabetes including 175 million adults who have diabetes but are yet to be diagnosed. It has affected 8.3% of the entire adult population (ages 20-79) majority being between the ages of 40-59 with slight male predominance. This number is projected to increase by 55% by 2035. 80% of all diabetes patients live in low and middle income countries and urban areas harbor 69% of the total diabetes population. Lifestyle changes and urbanization is responsible for the alarming increase in diabetes especially Type II.<sup>2</sup>

In 2013, IDF stated that an estimated 19.8 million adults in the Africa Region have diabetes. The highest number of undiagnosed cases are also found in Africa, at least 63%.<sup>2</sup> Ethiopia, a low income country, has diabetes prevalence of 5.3%.<sup>5</sup> WHO had projected the rise of diabetes population in Ethiopia from 796,000 in the year 2000 to 1,820,000 in 2030, most of the diabetes population will be in rural areas of the country.<sup>2</sup>

### **1.2.2 Diabetic Retinopathy**

Diabetic Retinopathy is responsible for the 4.8% of the 37million blindness in the world.<sup>7</sup>It is the most frequent cause of new cases of blindness among working adults. Its worldwide prevalence is estimated to be 34.6% (93 million people).<sup>8</sup> DR affects both Type I and Type II diabetes patients. The Wisconsin Epidemiologic Study of Diabetic Retinopathy showed that prevalence and severity differs among patients diagnosed before and after the age of 30 and further among insulin users and non-users. Almost all of Type I Diabetic patients (97.5%) and 77.8% of Type II patients develop some degree of Diabetic Retinopathy after 15 years or more of living with diabetes<sup>9,10</sup>. A systemic review of studies from 21 African countries found that population based studies report DR prevalence at 30.2 to 31.6% while the clinical based studies put it at 7.0 to 62.6%<sup>11</sup>. Although there is no recent population based studies on prevalence of Diabetic retinopathy in Ethiopia, a hospital based study done in the largest referral hospital of the country found the prevalence of DR to be 37.8% with 36.1% having background retinopathy and 1.7%proliferative retinopathy.<sup>12</sup> Another study done in Jimma city found prevalence of DR to be 41.4% with 7.3% of patients having vision threatening diabetic retinopathy<sup>13</sup>.

## **1.3 Risk Factors of DR in DM**

### **1.3.1 Glycemic Control**

The Diabetes Control and Complications Trial study showed that intensive diabetes treatment in Type I diabetic patients taking insulin resulted in a marked decrease the incidence of by 76% and a 54% decrease in patients receiving routine treatment. In the WESDR study, increased level of glycosylated hemoglobin (HgbA1C), a marker of prolonged glucose level in blood, was associated with increased incidence and progression of PDR<sup>14</sup>. Its value of >8.0% was found to be significantly related to sight threatening diabetic retinopathy in a population based study done by Raman R et al. <sup>15</sup>while its decrease by 1% was associated with a 35% reduction of microvascular complications<sup>16</sup>.

### **1.3.2 Duration**

Many studies have demonstrated that longer duration of disease is an important predictive factor in development and progression of retinopathy both in Type I and Type II patients. The WESDR study showed that in patients diagnosed with diabetes before the age of 30, the prevalence of DR was 8%, 25%, 75% and 97.5% at 2years, 5years, 10years and >15 years. In younger onset patients PDR was present only in 1.2% of those who had DM for <10years and in 67% of those with >35years duration of disease<sup>9,10</sup>. Prevalence of macular edema was seen also to increase from 3% to 28% in older onset diabetes patients with disease duration of <5years and >20 years respectively<sup>17</sup>.

### **1.3.3 Blood Pressure**

There are many studies showing that blood pressure control decreases macro and microvascular complications of diabetes. WESDR has identified a strong association between systolic blood pressure and the development and severity of diabetic retinopathy in those who have had diabetes for <15 years. The UKPDS done on Type 2 diabetic patients stated that a tight blood pressure control i.e. BP 144/82mmhg had a 34% reduction in visual acuity deterioration.

### **1.3.4 Insulin**

Although glycemic control is the more important factor, dependence on insulin has been shown to predict the course of retinopathy. When compared to Type II diabetic patients using insulin, those not on insulin have lower prevalence of back ground diabetic retinopathy, PDR

and macular edema. According to WESDR population, retinopathy was more frequent and severe in those with very low levels of plasma C-peptide (a measure of endogenous insulin secretion)<sup>18</sup>.

#### **1.3.4 Pregnancy**

Pregnancy is known to increase the progression of diabetic retinopathy. WESDR showed that pregnant women with type 1 diabetes have twice the risk of developing PDR than non-pregnant women. In a hospital based study done in Saudi Arabia on insulin-dependent pregnant women, 24% showed progression of diabetic retinopathy. The study also showed that duration of diabetes >15 years, poor glycemic control and hypertension are high-risk factors in the progression of DR in pregnancy<sup>19</sup>.

### **1.4 Natural History and Classification of DR**

Diabetic retinopathy is a progressive condition mainly propelled by uncontrolled hyperglycemia and many other risk factors. Initially, a patient can have no features of DR, NoDR. As microvascular changes occur, DR starts out with non-proliferative changes, Non-Proliferative diabetic Retinopathy, NPDR. NPDR can be mild, moderate or severe. Later it proceeds to proliferative and further vision threatening stage. The following descriptive classification is also used clinically.

#### **1.4.1 Background Retinopathy (Non-proliferative)**

In the early stages of the disease, diabetic retinopathy begins as a results occlusion, dilation and maybe increased permeability of the retinal microvasculature. This is characterized by microaneurysms, dot and blot hemorrhages, and exudates.

#### **1.4.2 Pre-proliferative Diabetic Retinopathy (PPDR)**

With an advancing disease, these changes persist and more severe Pre-proliferative changes like cotton wool spots, venous changes, abnormal shunts and deeper retinal hemorrhages appear.

#### **1.4.3 Proliferative Diabetic Retinopathy (PDR)**

As this progressive retinal ischemia worsens, abnormal fragile vessels start appearing on the retina, the posterior vitreous surface and even around anterior chamber angles) causing bleeding in the eye and glaucoma.

#### **1.4.4 Advanced Retinopathy**

Development of fibro vascular tissues in PDR can cause traction and hence detachment of the retina. Neovascularization at the anterior chamber angles can lead to glaucoma.

#### **1.4.5 Diabetic Maculopathy**

Pathologies at the macula can develop at any time in the progression of diabetic retinopathy, in non-proliferative or proliferative stages. Macular edema characterized by thickening of the retina due to leaky vessels and macular ischemia. The most widely used classification, the Early Treatment Diabetic Retinopathy Study classification.

### **1.5 Screening for DR**

It is reported that 26% of Type I and 36% of Type II patients had never been examined. According to the AAO screening guideline, Type I DM patients need annual eye examination starting 5 years from onset of disease or diagnosis whereas Type II DM patients should be screened at the time of diagnosis then yearly. Patients with NoDR up to Moderate NPDR shall be screened 3-12 monthly and those with severe NPDR should be examined 1-3 monthly. Diabetic patients who get pregnant need to be reviewed soon after conception and within the first trimester. But mothers who develop gestational diabetes need no screening for DR<sup>21</sup>. As defined by the Early Treatment Diabetic Retinopathy Study (ETDRS) group, the gold standard for the detection of DM is stereoscopic color 30° fundus photographs in 7 standard fields<sup>22</sup>. The most commonly used method is ophthalmoscopy (Direct or indirect). In systematic review the sensitivity of detecting any DR by dilated direct ophthalmoscopy alone ranged between 45-98% and the specificity ranged between 62-100%<sup>23</sup>. Patients with NPDR, PDR and d macular edema should be referred to an ophthalmologist and findings should be informed to the physician. It is recommended that the target for glycemic control should be HbA1c of 7.0% or less.

### **1.6 Treatment of DR**

#### **1.6.1 Laser**

Laser photocoagulation is the main therapy for sight threatening DR. The Diabetic Retinopathy Study (DRS) showed that panretinal photocoagulation (PRP) significantly reduces the risk of severe vision loss from PDR by at least 50% and that focal or grid laser treatment reduces the risk of moderate vision loss from CSME by at least 50%<sup>24</sup>.

### **1.6.2 Vitrectomy**

Vitreous hemorrhage and traction with retinal detachment are the late complications of vitreous contraction in PDR. The Diabetic Retinopathy Vitrectomy Study (DVRs), reported that patients who underwent early vitrectomy within 3 months) achieved visual acuity  $\geq 6/12$  in 25% at the 4-year follow-up.<sup>25</sup>

### **1.6.3 Intravitreal Corticosteroids**

Intravitreal corticosteroids inhibit the main pathogenesis implicated in DME. The Diabetic Retinopathy Clinical Research Network showed that intravitreal triamcinolone resulted in better mean visual acuity and decrease in retinal thickness at 4 months.<sup>27,28</sup>

### **1.6.4 Intravitreal Anti-VEGFs**

Vascular Endothelial Growth Factor (VEGF) initiates growth of abnormal vessels and increases vessel permeability which is involved in the pathogenesis of both diabetic neovascularization and DME. Thus, specific anti-VEGF drugs like bevacizumab (Avastin), and ranibizumab (Lucentis), have been used for the treatment of DME. The DRCR.net study and the BOLT studies showed, intravitreal ranibizumab showed superior improvements in best corrected visual acuity (BCVA) compared with laser treatment alone.<sup>29,30</sup>

## **2.0 CHAPTER TWO: LITERATURE REVIEW**

### **2.1 Knowledge, Attitude and Practice on Diabetic Retinopathy**

A KAP survey is a representative study of a specific population to collect information on what is known, believed and done in relation to a particular topic. The understanding by a community of any given topic is the Knowledge possessed. Attitude refers to their feelings towards this subject, as well as any preconceived ideas that they may have towards it. Practice is the ways in which they demonstrate their knowledge and attitude through their actions. Prevention of a serious visual loss in a diabetic patient depends on the awareness of the disease process, complication, and regular follow-ups. Assessing the level of knowledge, attitude and practice regarding diabetes and diabetic retinopathy will allow the health service giving body to tailor the care according to the needs of the community. The level of knowledge of diabetes and diabetic retinopathy varies widely across different countries and communities. The figures also vary on whether the study done is a population study or a hospital based one.

#### **2.1.1 Knowledge on Diabetic Retinopathy**

A hospital based study done in South India among type II diabetes patients showed a higher level of knowledge about DR at 72.5%. However knowledge of risk factors and treatment modalities was low; only 29% were aware that uncontrolled blood sugar was a risk factor and 54% of them know that diabetic retinopathy can be treated<sup>36</sup>. In a population based study done in the rural part of India, the knowledge on diabetic retinopathy was 37.1% which was significantly higher in those of upper socioeconomic status, compared with extreme lower socio-economic status (OR=1.85; 95% CI: 1.32-2.58)<sup>34</sup>. This was a significantly higher value than a cross-sectional study done in Gaddap town, Karachi with 527 respondents, which stated the knowledge level on DR at a very low 17.5%<sup>35</sup>. In the Indian study above, the group that had knowledge about DR also knew more about the various treatment options.

In the first phase of a cross-sectional national survey done in India to estimate the prevalence of diabetes and its correlates, the survey compared the knowledge and awareness of diabetes in urban and rural India. Only 43.2% (6160/14,274) of the overall study population had heard about a condition called diabetes. The study revealed that urban residents had higher awareness rates (58.4%) compared to rural residents, (36.8%). The urban dwellers also had more awareness of risk factors, prevention and complications of diabetes. Among the



participants of the study who believed diabetes affects other organs, 52.3% agreed that the eyes were affected, proceeded only by the feet at 54%. This study attributes this marked difference between rural and urban population to education. When awareness of diabetes was assessed, only 23.7% of illiterate individuals, those with no formal schooling, reported that they have heard about a condition called diabetes compared with 52.2% of literate individuals, those with primary education and above.<sup>40</sup>

According to the above study the awareness of diabetes and its complication was expectedly higher in the diabetic population than the general population. In the study done in Karachi, Pakistan, significant statistical difference was found between sample population with and without diabetes as 41 percent of sample population with diabetes had knowledge of diabetes and DR in comparison with 35 percent of sample population without diabetes. Diabetics also showed better practices scores than non-diabetics, 42% and 36% respectively. The study stated that the possible explanation for this result was that the diabetics were taking precautions in order to avoid and control diabetes.<sup>35</sup>

In many studies, level of education has come out as being a key factor in the awareness of diabetes and its complications. In a study done by Cheruiyot et al amongst diabetic patients in Kenyatta National Hospital, Kenya, knowledge level of diabetic retinopathy was at 10% amongst those with none to primary level education but 39% amongst those with secondary and tertiary level education. Higher monthly income was also found to be a significant factor in knowledge but not sex.<sup>39</sup>

In a population based study done in rural India after a series of awareness creating meetings with the study population, similar results were obtained. About 19% of those with none to primary school education level had knowledge of diabetes and an even lesser 13% on Diabetic retinopathy. On the other hand, 61% and 42% of those with secondary and tertiary level education knew about diabetes and diabetic retinopathy respectively. Individuals in the older age group (40-49 years) and a high socioeconomic status had higher DR knowledge. Women had better knowledge of diabetes but not of retinopathy. Those who knew about diabetic retinopathy also had better knowledge of different treatment modalities for DR.

### **2.1.2 Attitude and Practice Towards Diabetic Retinopathy**

The effect of knowledge on attitude and practice has been studied in different studies. They show that knowledge doesn't always equate to good attitude or practice. In Kano, Nigeria,

84.3% of the 185 diabetic patients were found to be aware of diabetic retinopathy but there was little or no knowledge of retinopathy risk factors or the need for early detection through screening. Practice towards diabetic retinopathy was also very low with only 15.7% patients having undergone diabetic retinopathy screening<sup>37</sup>. Similarly, a study done in South Africa amongst DM patients showed a low level of practice despite good level of awareness and attitude towards DR. In this study, 97.3% had the knowledge that DM affects the eyes and 73% believed it was very important to have regular eye exam even when blood sugar levels were controlled. However, only 37% actually had an annual eye examination<sup>38</sup>. In Nepal, of those respondents who had highly sufficient knowledge, none had highly satisfactory attitude whereas 23.3 % had highly satisfactory practice. Those respondents who had highly insufficient knowledge, 17.3 % had highly satisfactory attitude and 7.7 % had highly satisfactory practice. An interesting finding in this study was that attitude decreased with increased in knowledge and likewise, when the level of attitude is increased, the level of practice is decreased. The authors stated that this could be due to lack of motivation to apply the knowledge into action or practice and conservative thoughts with over confidence.<sup>41</sup>

So, what really affects attitude and practice towards diabetic retinopathy? The study by Cheruiyot et al in Kenya clearly showed that there was significant association between practices of eye checkup and higher knowledge of Diabetic retinopathy. Marriage was also a positive factor in increased practice. A comparison between the group with knowledge and the group with no knowledge revealed statistically significant differences in terms of adopting the correct attitude and practices related to DR in the rural India study. Out of those with knowledge on DR, 93% agreed that all diabetics must undergo eye examinations. Most of those with knowledge, 66.5%, said that those with good sugar control cannot avoid eye examinations, compared to 44.5% of those in the no knowledge group. Other positive factors shown to affect practice in different studies are longer duration with the disease and having family members with the disease. Highly sufficient level of practice regarding diabetes was higher among those who were suffering from diabetes for >5-10 years in the Nepal study<sup>41</sup>. Although it didn't specify for diabetic retinopathy, with regards to diabetes, this study showed higher practice level in females than males which was not the case in most studies.

Low level of satisfactory practice toward diabetic retinopathy has been demonstrated in many studies. In the study by Gilbert et al in Kenya, only 7.1% of pregnant diabetic mothers went for an eye examination despite 63% of all participants strongly agreeing that a pregnant

diabetic mother should see and eye specialist. It blames the low level of practice on the low level of education, low economic status and low referral rates by physicians. It is shown in other studies that the primary source of knowledge are doctors/health professional, the mass media and fellow diabetic patients.<sup>36</sup> In the Kano, Nigeria study<sup>37</sup>, although 80.5% knew diabetic retinopathy could lead to blindness, only 15.7% had had retinopathy screening. There was little or no knowledge on the need for early detection through screening. Therefore, a need for increasing this awareness and the provision of access to retinopathy screening services to the patients was pointed out by the authors.

The level of knowledge, attitude and practice is higher in hospital-based studies than studies done in the general population. As many of the studies indicate, the primary source of knowledge regarding diabetic retinopathy is the hospital environment (staff and fellow patients) followed by other sources like the mass media. There is a pattern showing literacy or level of education and higher socio-economic status to be two key factors positively affecting the level of awareness and practice regarding diabetes and diabetic retinopathy<sup>34, 39</sup>. That could also be the source of difference in KAP level seen between the developed and developing countries.

Not many studies have been in Ethiopia about awareness of diabetes and diabetic retinopathy. But Ahmed et al<sup>42</sup> did a study in Ethiopia among diabetic patients attending the Jimma University Specialized hospital in southwestern Ethiopia, in the hospital of interest of this study. In this study they found that 68% of the patients had knowledge of the chronic complications of diabetes. Among the patients who knew about chronic complications of DM, 25% had Diabetic retinopathy followed by hypertension (20%). The literacy status was found to be statically associated with the knowledge about chronic complications (P-Value=0.029) (Table 4). The awareness of DR in most studies appears to be shallow, reflected by poor knowledge of risk factors and treatment modalities. The level of practice is also unsatisfactory. Although the lack of knowledge of DR is stated as a cause, even in the population with good to excellent level of awareness, the practice of regular eye examination is low.

## **2.2 Impact of KAP Studies on the Level of Knowledge, Attitude and Practice Regarding Diabetic Retinopathy**

As KAP studies aim to assess the level of knowledge attitude and practice regarding a topic and possibly the factors associated, it is important to see their impact later on. During the preparation of this proposal, no document was traced that shows the direct effect of a KAP study on the eye care practice of diabetic patients. This possibly is due to lack of follow up studies to asses such sequel. Nonetheless, there have been studies that assess the impact of an awareness program on knowledge of diabetic patients. In Chaitaniya hospital, India a single point study was done<sup>44</sup> where knowledge of the patients was assessed before and after a health education was given. A 91.7% improvement in the awareness of diabetic retinopathy was seen after a health education was provided. 73.8% improvement in the awareness of requirement of an annual eye examinations and 50.06% improvement in the necessity of dilated eye examinations as the method of diagnosis of diabetic retinopathy was also recorded. Furthermore remarkable improvement was seen in the awareness of other systemic conditions as risk factors and treatment options of diabetic retinopathy.

A study done by Guade et al.<sup>43</sup> in JUSH in 2009 showed that the prevalence of diabetic retinopathy was 41.4%. Vision threatening diabetic retinopathy was found in 7.3% of patients. The study also found that only 14.5% of these patients had prior eye checkup. This shows that there is a poor eye care seeking behavior among the diabetic patients following up in the regular clinic evidenced by low number of patients with eye exam and severity of disease at initial examination. It is crucial to find out what the cause of this less than satisfactory practice and act on it. This goes to show any gap of knowledge, attitude and practice that exists can be traced by a study of such sort, to further design and provide a more efficient awareness program or health education system for the diabetic patients on follow up in the hope of tackling the predicted rise in diabetes and its blinding complications.

## **2.3 Study Rationale**

- a.** No studies have been done on the knowledge, attitude and practice of DR among diabetic patients in the study area.
- b.** The data acquired will provide baseline information on the level of knowledge, attitude and practice of DR among patients with diabetes at the Jimma University Specialized Hospital.
- c.** The information gathered will be useful in planning for DR awareness strategies among patients with diabetes in the hospital, region and even Ethiopia to improve the low eye care seeking behavior of diabetic patients.
- d.** The study can show if a gap exists in the knowledge, attitude and practice in towards DR among DM patients and its possible causes. This will in could help tackle the estimated increase of diabetic patients and subsequently of blinding diabetic retinopathy in the study area and further in Ethiopia.

## **2.4 Study Objectives**

### **2.4.1 Broad Objectives**

The study sought to establish the levels of knowledge, attitude and practice on diabetic retinopathy amongst the diabetic patients visiting diabetic clinic at the Jimma University Specialized Hospital in Ethiopia

### **2.4.2 Specific Objectives**

- To determine the current knowledge levels on diabetic retinopathy (DR) among diabetic patients.
- To determine the attitude among diabetic patients towards diabetic retinopathy
- To determine the practices among the diabetic patients regarding DR
- To identify factors that affect the knowledge, attitudes and practices of diabetic patients with regards to diabetic retinopathy.

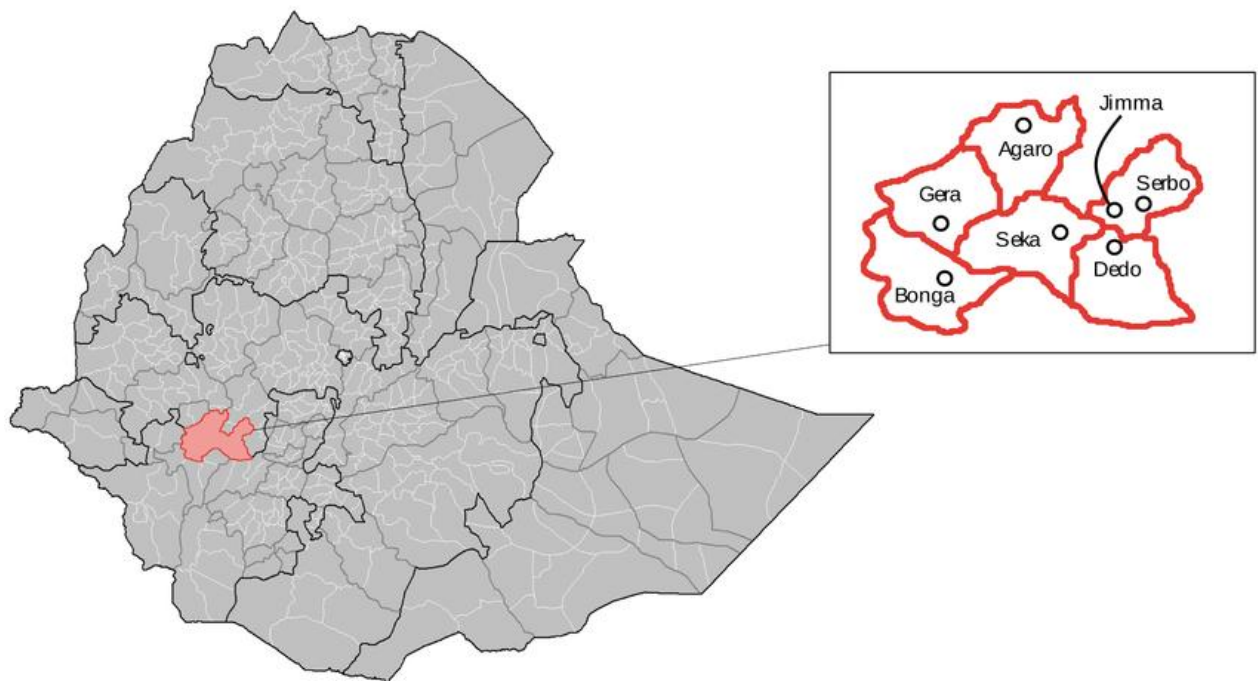
### 3.0 CHAPTER: METHODOLOGY

#### 3.1 Study Design

This was a cross-sectional hospital-based study.

#### 3.2 Study area

Jimma University Specialized Hospital (JUSH) in Jimma town, Southwestern Ethiopia.



*Figure 1: Map showing the location of the study area*

#### 3.3 Study population

The study population was all diabetic patients on follow-up at the Jimma University

Specialized Hospital (JUSH) diabetic out-patient clinic.

#### 3.4 Study setting

This study was conducted in diabetic patient clinic of Jimma University Specialized Hospital in Jimma, Ethiopia. It is located in the southwest part of the country, 352 km from the capital

Addis Ababa. It is the largest hospital in the southwest region with a catchment area of about 15 million and with a bed capacity of 400 currently but has built a new 600-bed wing, which will soon be functional. The medical diabetic clinic runs twice weekly (Monday and Tuesday), on average seeing 50-90 patients per day.

### 3.5 Study period

The study was carried out in 26<sup>th</sup> December, 2016- 13<sup>th</sup> January, 2017.

### 3.6 Sample Size

Sample size calculation was done using Cochran's sample size formula for proportion<sup>45</sup>

$$N = Z^2 * P(1-P) / D^2$$

Where

**N** is the required sample size

**Z** is the cut off points along the X-axis of the standard normal probability distribution that represents probabilities matching the 95% confidence interval (1.96)

**P** is the prevalence of knowledge about DR among diabetic patients in a similar study in Kenyatta National Hospital, Nairobi, Kenya

**D** is precision of study set at 0.05

Thus upon replacement of the appropriate values in the formula, the sample size was calculated as

$$N = \frac{1.96^2 * 0.95(1-0.95)}{0.05^2}$$

$$N = 73$$

Then it was corrected for finite population with the formula

$$n = \frac{n_0}{1 + n_0/N} = \frac{73}{1 + 73/720} = 66$$

Where

$n$  is corrected sample size

$n_0$  is 73

$N$  is study population (720 patients attending the clinic)

The corrected minimum sample size came to **66**

### **3.7 Sampling Method**

The first patient for the day was selected by lottery (between the 1<sup>st</sup> and the 2<sup>nd</sup> patient on the day's registry). A systematic sampling was then followed and every-other patient from the registry was picked. Therefore, depending on the first patient picked, the sampling followed either the even numbers or the odd numbers from the day's registry.

### **3.8 Case Definition**

Patients diagnosed with diabetes mellitus by a physician.

### **3.9 Inclusion criteria**

- i. All diabetic patients who were attending diabetic clinic at JUSH
- ii. Patients of age 18 and above and gave consent

### **3.10 Exclusion criteria**

- i. Patients unable to take the questionnaire (mental illness, communication barrier etc.)

### **3.11 Materials**

Questionnaire regarding the knowledge, attitude and practice was administered to the diabetic patients in the diabetic follow up clinic. Interviewers who were selected and oriented read out the questions to the participants and also marked the answers on the pre-coded question papers themselves.

#### **3.11.1 Structured Interview (Appendix 1)**

The questions in the questionnaire are choice questions where in some the respondents can choose more than one answer. Some of the question were left open to get more explanation about the patients 'answers or to get answers other than what has been stated in the choices.

Questions in the knowledge section were designed to test the knowledge of respondents on diabetic retinopathy. The questions included:



- i. Definition of Diabetic Retinopathy
- ii. Risk factors for DR
- iii. Screening of DR
- iv. Treatment options for DR

Questions included in the Attitude section were designed to gauge the prevailing attitudes, beliefs and misconceptions among diabetic patients about diabetic retinopathy. Statements were provided and the respondents were asked to indicate the extent to which they agreed with the statements, on a pre-determined scale (strongly disagree, moderately disagree, neutral, moderately agree, and strongly agree). The questions covered:

- i. Eye screening and importance
- ii. Prevention and treatment of Diabetic Retinopathy

Questions included in the Practice section were designed to assess the practices of the diabetic patients with regard to diabetes and diabetic retinopathy. The questions included:

- i. Eye screening practices.
- ii. Practices regarding DM
- iii. Referral practices

The English version of the questionnaire was validated by administering it to diabetic patients in KNH diabetic follow up clinic. The validation was aimed at assessing the ease of comprehension, relevance to the intended topics, effectiveness in providing useful information, and the degree to which the questions are interpreted and understood by the study population. The questionnaire was translated into two local languages and was pre-tested again on a representative group of diabetic patients in the outpatient diabetic follow up clinic in JUSH as well. The questions were administered by the interviewer in the Diabetic follow up clinic.

### **3.12 Study Procedure**

The KNH/UON Research and Ethics Committee, as well as the Ophthalmology and Internal Medicine departments of the JUSH, gave ethical approval for this study. Interviewers (ophthalmic nurses) were then recruited and trained on how to administer the questionnaires. They were familiarized and briefed about the study, its objectives, how the interview was to

be conducted and the flow of the questionnaire. The questionnaire was translated into the two local languages, Amharic and Oromiffa.

On each day of the data collection, the patients were informed that participation in the study was voluntary and the information gathered was to be used solely for academic and intended purposes. Patients who were willing to participate in the study signed the consent form. The questionnaire was administered in the language of the patient's preference. Participants were interviewed only once during the study period.

Each questionnaire was coded. The name of a participant was not indicated in the interviewer-administered questionnaires. The age, sex, marital status, occupation, residence, education level and monthly income was inquired and noted on the questionnaire. Data on KAP was filled on the questionnaire (appendix I) as the patient gave his/her responses.

### **3.13 Data Management and Analysis**

The quantitative data was collected, entered, cleaned and analyzed using SPSS version 20. It was summarized into proportions for categorical data such gender and age. All statistical tests were performed at 5% level of significance (95% confidence interval). Qualitative data was organized in line with the themes of the study in the discussion section.

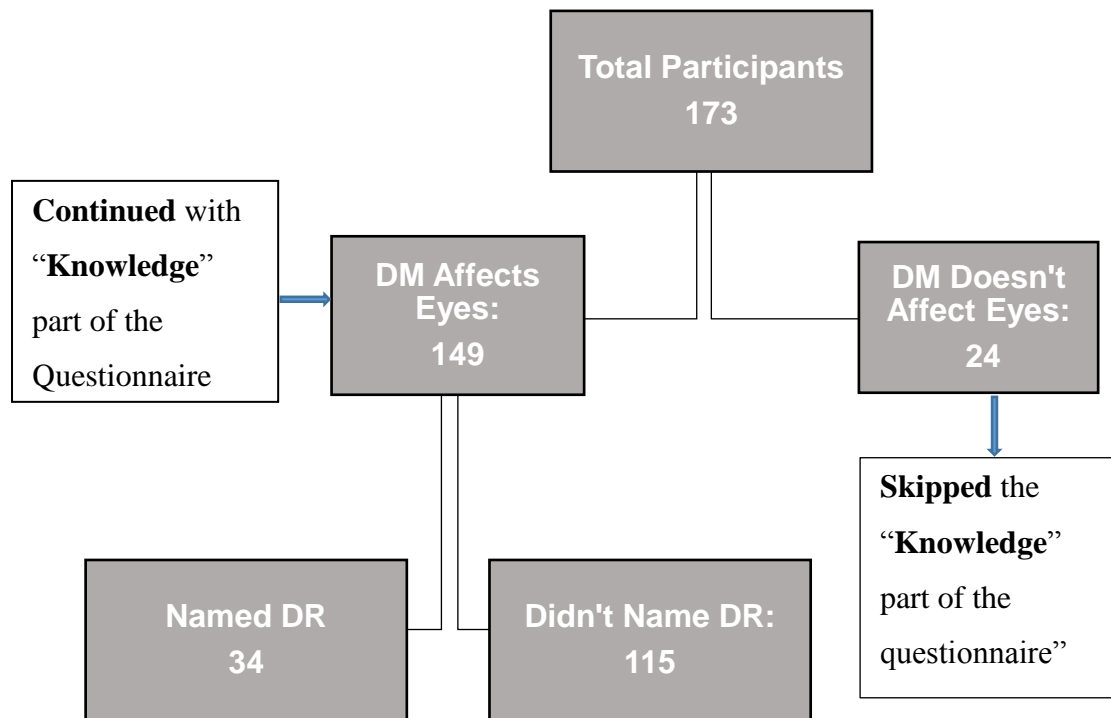
### **3.14 Ethical Considerations**

Ethical approval was sought from KNH/UON ethics and research committee as well as Jimma University Specialized Hospital. Prior to conducting the interviews, the principal investigator and the interview administrators explained what the study was and what it aimed to achieve. Participants were informed that participation was fully voluntary and that there are no expected risks or monetary benefits from participating in this study. An informed consent was provided to the willing participants. The consent was signed by signature of the participants. Avoiding the use of names and instead using pre-coded questionnaires ensured participants' confidentiality

The information gathered from this study will be published as a thesis and a manuscript. It will be further disseminated in conferences as well as given as a feed back to the diabetic follow-up clinic, the overseeing department and the ophthalmology department of the hospital.

## 4.0 CHAPTER FOUR: RESULTS

Figure 2: Flow chart of the participants



*Figure 3: Distribution by Sex of Participants*

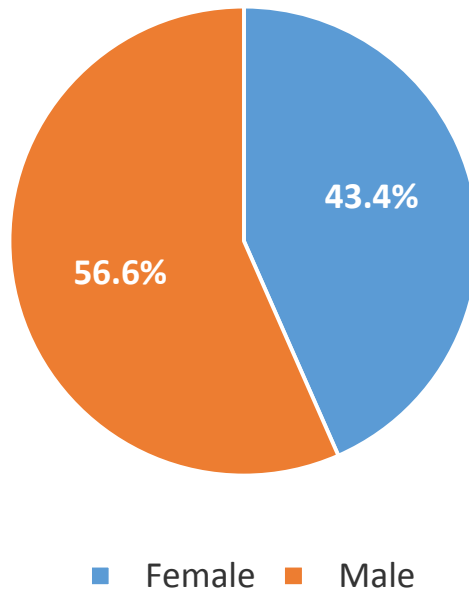
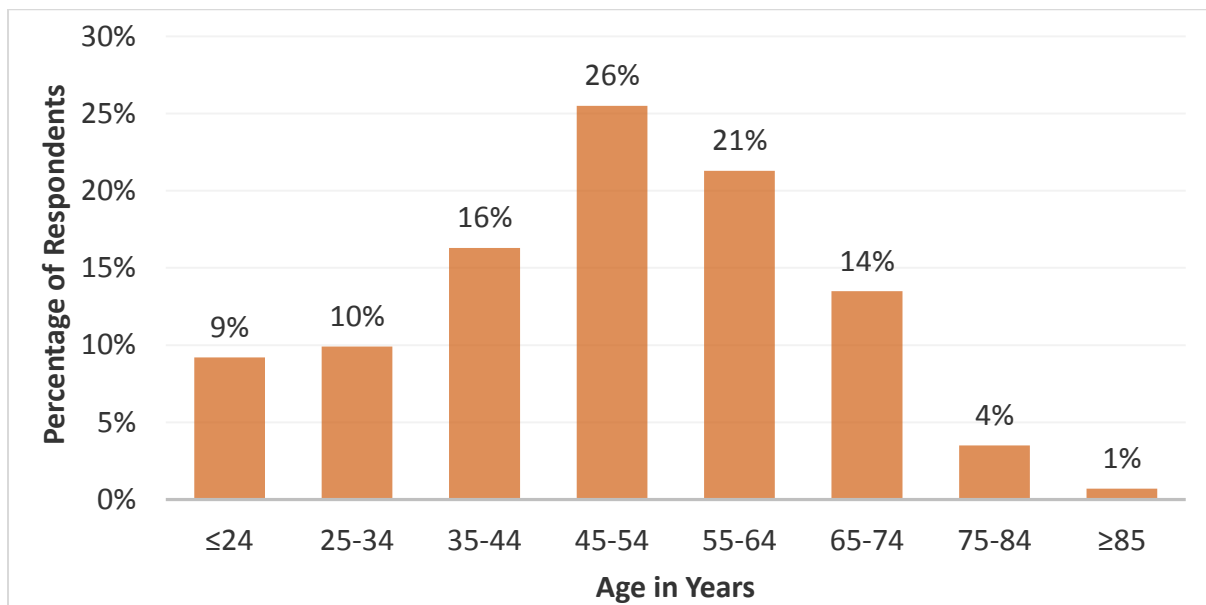


Figure 4: Distribution by Age of participants



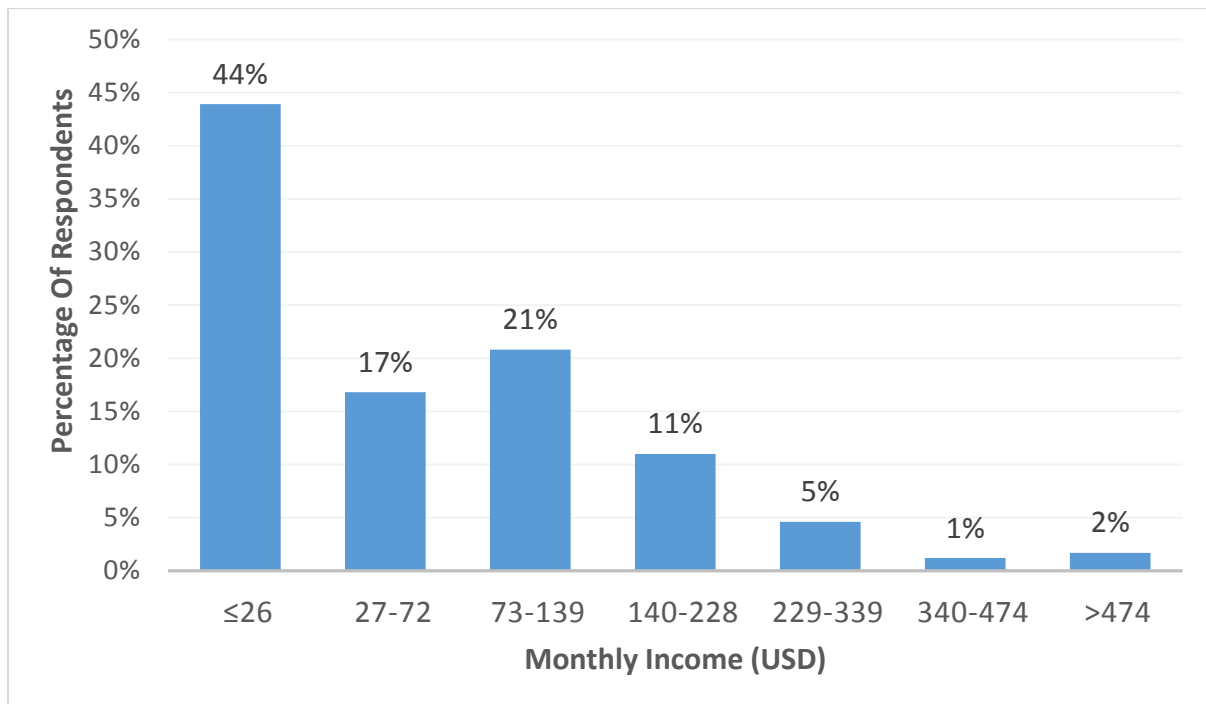
The age range of participants was 18-85 with mean age 49.2 (SD 15.4).

Table 1: Socio-demographic data of the participants

<b>Variable</b>	<b>Frequency (N=173)</b>
<b>Marital Status of Respondents</b>	
Single	22 (2.7%)
Married	127 (73.4%)
Widowed	17 (9.8%)
Separated/Divorced	7 (4.0%)
<b>Residence</b>	
Urban	83 (48.0%)
Rural	90 (52.0%)
<b>Occupation</b>	
Formal Employment	33 (19.1%)
Casual laborer	18 (10.4%)
Merchant/Business	13 (7.5%)
Farmer	54 (31.2%)
Unemployed	49 (28.3%)
Student	6 (3.5%)
<b>Level of Education of Respondents</b>	
No Formal Education	66 (38.2%)
Primary Education	49 (28.3%)
Secondary Education	28 (16.2%)
Tertiary Education	30 (17.3%)

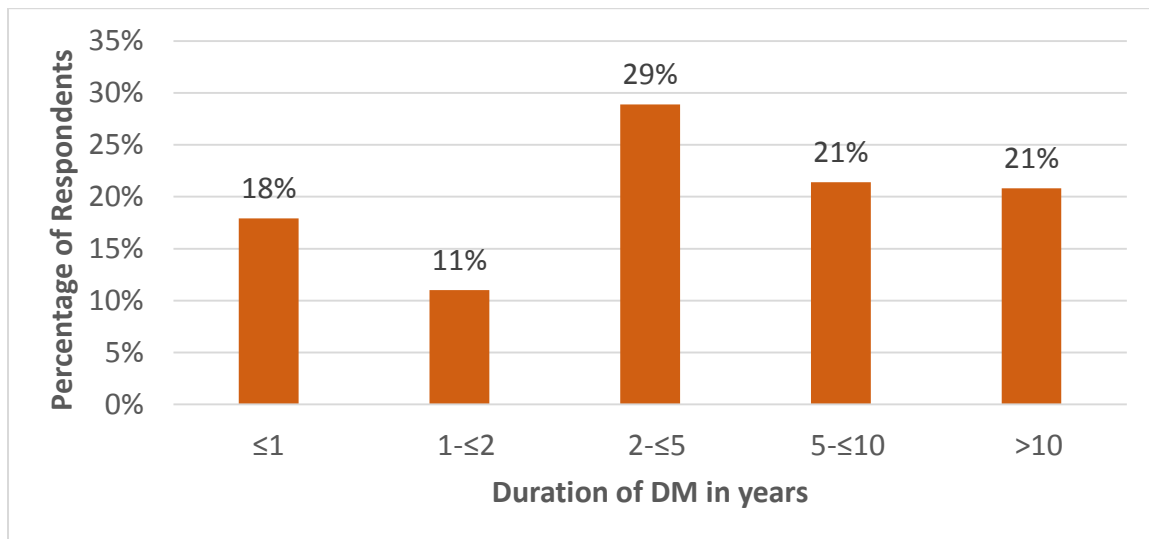
Most of the respondents were married, 127 (73.4%), farmers, 54 (31.2%) and resided in rural areas, 90 (52.0%). Around 38% had no formal education.

Figure 5: Income distribution of participants



Classification of the income is based on the Ethiopian government salary range which is also used for income tax. In the current exchange rate, 1 Ethiopian Birr is 0.044 US Dollar. (1 USD=23 Br)

Figure 6: Duration of Diabetes Illness



More than half of the respondents (57.8%), have been diabetic for less than 5 years while 20.8% have been with the disease for more than 10 years.



Table 2: Knowledge on effect of Diabetes on Eyes

Variables	Frequency (%)
<b>Does diabetes affect the eyes? N=173</b>	
Yes	149 (86.1%)
No	4 (2.3%)
Don't know	20 (11.6%)
<b>Does diabetes cause blindness? N=173</b>	
Yes	141 (81.5%)
No	6 (3.5%)
Don't know	26 (15.0%)
<b>How did you know about effects of DM in the eye? (N=149)</b>	
Health professionals in the DM follow up clinic	85 (57.0%)
Ophthalmologist/Optomtrist/Optician	9 (6.0%)
Eye camp	2 (1.3%)
Family member/Friend/Other DM patients	22 (14.8%)
TV, magazines, other media	16 (10.7%)
Other	15 (10.1%)

Majority of the participants, 149 (86.1%), knew that diabetes affects the eye and even causes blindness, 141 (81.5%). Those patients who knew that DM affects eyes were considered to have a general awareness of DR and continued with the rest of knowledge determining questions about riskfactor, screening and treatment.

Table 3: Knowledge of DR

Variable	Number (%)
<b>Which eye condition does DM specifically cause? (n=149)</b>	
Diabetic Retinopathy	34 (22.8%)
Cataract	32 (14.8%)
Glaucoma	9 (6.0%)
Other	5 (3.4%)
Don't Know	79 (53.0%)
<b>What is Diabetic Retinopathy? (n=149)</b>	
The same as cataract	13 (8.7%)
It is high sugar level in the eye	23 (15.4%)
It is changes in the blood vessels of the retina due to diabetes	10 (6.7%)
It is high pressure in the eye	5 (3.4%)
Other	5 (3.4%)
Don't know	93 (62.4%)

From those patients who knew that diabetes affects the eyes, only 34 (22.8%) were able to correctly name “Diabetic Retinopathy” as the condition specifically related to diabetes. Only 10 (6.7%) described the disease process of Diabetic Retinopathy.

Table 4: Knowledge on Risk factors, prevention and treatment of Diabetic Retinopathy

<b>Variable</b>	<b>Frequency (%)</b>
<b>What are the risk factors for developing the eye disease of DM? (n=149)</b>	
Poorly controlled blood sugar	68 (45.6%)
Long duration of diabetes disease	37 (24.8%)
Hypertension	25 (16.8%)
High BMI/Obesity	16 (10.7%)
Pregnancy	4 (2.7%)
Smoking	7 (4.7%)
Don't Know	50 (39.6%)
<b>Is the eye disease of DM preventable? (n=149)</b>	
Yes	<b>109 (73.2%)</b>
No	3 (2.0%)
Don't know	37 (24.8%)
<b>Is blood sugar control important in preventing the eye disease of DM? (n=109)</b>	
Yes	<b>109 (100.0%)</b>
No	0 (0.0%)
Don't know	0 (0.0%)
<b>Is the eye disease of DM treatable? (n=149)</b>	
Yes	<b>113 (75.8%)</b>
No	5 (3.4%)
Don't know	31 (20.8%)
<b>Which types of treatments do you know for the eye disease of DM? (n=113)</b>	
Intravitreal injection	9 (8.0%)
Laser	16 (14.2%)
Surgery	20 (17.7%)
Other	5 (4.4%)
Don't Know	81 (71.7%)

As most of the patients were not aware of the term Diabetic Retinopathy, further questions on DR were phrased to the participants as “The eye disease of Diabetes”. Patients who knew the risk factors and treatment of DR were allowed to pick more than one risk factor and type of treatment. Those who answered “No” to the question whether blinding DR is preventable or treatable were left out of further questions on prevention and treatment.

Table 5: Knowledge on Screening of Diabetic Retinopathy

Variable	Frequency (%)
<b>Do DM patients need to see an eye doctor? (n=149)</b>	
Yes	134 (89.9%)
No	6 (4.0%)
Don't know	9 (6.0%)
<b>Does a DM patient need a regular eye checkup?(n=149)</b>	
Yes	132 (88.6%)
No	5 (3.4%)
Don't know	12 (8.1%)
<b>When should a DM patient visit an eye doctor? (n=149)</b>	
Immediately after diagnosis of DM	88 (59.1%)
1 year after diagnosis	20 (13.4%)
5 years after diagnosis	2 (1.3%)
Other	20 (13.5%)
Don't know	19 (12.8%)
<b>What eye exam does a DM patient need to diagnose DR? (n=149)</b>	
Visual Acuity	41 (27.5%)
Checking for eye glass	4 (2.7%)
Dilated examination of the back of the eye	21 (14.1%)
Slit lamp/Torch examination of the front of the eye	5 (3.4%)
Other	3 (2.0%)
Don't know	75 (50.3%)

From those patients who were aware of diabetes affecting the eye, about 132 (89% )were aware of the need for regular eye check up but only 21 (14%) knew that dilated eye exam is needed to diagnose it.

Table 6: Attitude towards Diabetic Retinopathy

Variables	Frequency (%) N=173
<b>Eye examination is required in DM patients even when vision is not affected.</b>	
Strongly disagree	8 (4.6%)
Moderately disagree	13 (7.5%)
Neutral	11 (6.4%)
Moderately agree	56 (32.4%)
Strongly agree	85 (49.1%)
<b>Good blood sugar control is important in preventing blinding DR.</b>	
Strongly Disagree	7 (4.0%)
Moderately Disagree	0 (0.0%)
Neutral	31 (17.9%)
Moderately Agree	40 (23.1%)
Strongly Agree	95 (54.9%)
<b>A pregnant DM patient should have examinations.</b>	
Strongly Disagree	7 (4.1%)
Moderately Disagree	0 (0.0%)
Neutral	60 (34.9%)
Moderately Agree	40 (23.3%)
Strongly Agree	65 (37.8%)
<b>Treatment can be given to prevent blinding DR.</b>	
Strongly Disagree	2 (1.2%)
Moderately Disagree	5 (2.9%)
Neutral	90 (52.0%)
Moderately Agree	39 (22.5%)
Strongly Agree	37 (21.4%)

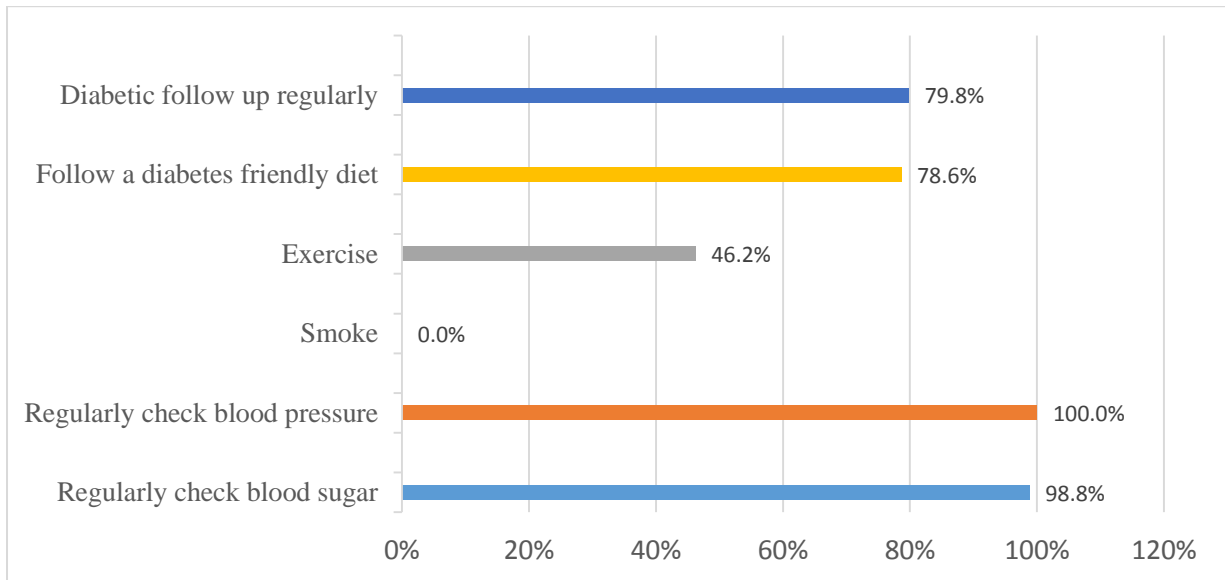
About 20% of the patients do not believe that eye screening is needed in the absence of any eye symptoms.

Table 7: Practice on Diabetic Retinopathy

Variable	Frequency (%)
<b>Have you been referred by DM clinic to see an eye doctor? N=173</b>	
Yes	94 (54.3%)
No	79 (45.7%)
<b>Have you been examined by an eye doctor after your DM diagnosis? N=173</b>	
Yes	91 (52.6%)
No	82 (47.4%)
<b>In the past year, how many times were you examined by an eye doctor? n=91</b>	
None	14 (15.4%)
Once	42 (46.2%)
Twice	21 (23.1%)
3 or more times	14 (15.4%)
<b>What kind of an eye exam did you get? n=91</b>	
Visual Acuity	20 (22%)
Checking for glasses	6 (6.6%)
Dilated examination of the back of the eye	49 (53.9%)
Slit lamp/Torch examination of the back of the eye	13 (14.3%)
Other	3(3.3%)
<b>Did you have an eye examination when you were last pregnant? (n=35, those who were already diabetic during their last pregnancy)</b>	
Yes	17 (9.8%)
No	15 (8.7%)
Don't know	3(1.7%)

About 47% of the patients did not have an eye examination after their DM diagnosis and of those, only about half had a dilated fundus exam. Out of the 35 patients who were already diagnosed diabetics during their last pregnancy, only 48.6% had an eye examination.

Figure 7: Diabetes related Practice of participants (N=173)



Almost all patients said that they check their blood sugar and blood pressure regularly, mostly once in 1-2 months. Around 80% said that they regularly follow their diabetic clinic appointments. When asked why some patients did not go for eye review, 49.5% (43) said that they didn't think it was necessary (they didn't experience eye problem or they didn't know they needed to) and 40.3% (35) said that they were not advised so by their following doctors. The rest stated that the facility was not convenient mainly because of long queues in the eye clinic or had financial problems.

Table 8: Factors Associated with Knowledge of Diabetic Retinopathy

Factors	DM Affects the eyes		Define DR	
	Yes N = 149	No N = 24	Correct N = 10	Incorrect N = 139
<b>Age</b>				
Mean (SD)	48.65 (15.75)	52.33 (13.50)	58.0 (10.31)	47.92(15.95)
<b>Sex</b>				
Male	66 (44.3)	9 (37.5)	3 (30.0%)	63 (45.3%)
Female	83 (55.7)	15 (62.5)	7 (70.0%)	76 (54.7%)
<b>Occupation</b>				
Formal Employment	29 (19.5)	4 (16.7)	6 (60.0%)	23 (16.5%)
Casual Laborer	17 (11.4)	1 (4.2)	0 (0.0%)	17 (12.2%)
Merchant/Business	12 (8.1)	1 (4.2)	0 (0.0%)	12 (8.6%)
Farmer	41 (27.5)	13 (54.2)	1 (10.0%)	40 (28.8%)
Unemployed	44 (29.5)	5 (20.8)	3 (30.0%)	41 (29.5%)
Student	6 (4.0)	0 (0.0)	0 (0.0%)	6 (4.3%)
<b>Residence</b>				
Urban	74 (49.7)	9 (37.5)	9 (90.0%)	65 (46.8%)
Rural	75 (50.3)	15 (62.5)	1 (10.0%)	74 (53.2%)
<b>Level of Education</b>				
No Schooling	53 (35.6)	13 (54.2)	2 (20.0%)	51 (36.7%)
Primary	43 (28.9)	6 (25.0)	1 (10.0%)	42 (30.2%)
Secondary	25 (16.8)	3 (12.5)	2 (20.0%)	23 (16.5%)
Tertiary	28 (18.8)	2 (8.3)	5 (50.0%)	23 (16.5%)
<b>Income (USD)</b>				
≤26	66 (44.3)	10 (21.7)	2 (20.0%)	64 (46.0%)
27-72	26 (17.4)	3 (12.5)	1 (10.0%)	25 (18.0%)
73-139	28 (18.8)	8 (33.3)	3 (30.0%)	25 (18.0%)
140-228	16 (10.7)	3 (12.5)	1 (10.0%)	15 (10.8%)
229-339	8 (5.4)	0 (0.0)	3 (30.0%)	5 (3.6%)
340-474	2 (1.3)	0 (0.0)	0 (0.0%)	2 (1.4%)
>474	3 (2.0)	0 (0)	0 (0.0%)	3 (2.2%)
<b>Duration of Diabetes (in Yrs.)</b>				
≤1	26 (17.4)	5 (20.8)	3 (30.0)	23 (16.5)
1-≤ 2	15 (10.1)	4 (16.7)	0 (0.0)	15 (10.8)
2-≤5	44 (29.5)	6 (25.0)	1 (10.0)	43 (30.9)
5-≤10	31 (20.8)	6 (25.0)	2 (20.0)	29 (20.9)
≥10	33 (22.1)	3 (12.5)	4 (40.0)	29 (20.9)

Knowledge on DM affecting the eye did not show much difference across the different variables like age, sex, occupation but slightly more knowledge was seen in those with tertiary level education, higher income and longer duration of DM disease. Eventhough there was a small number of patients who correctly defined DR, it showed that those living in urban areas, having formal employment and higher income were better able to define what DR was.

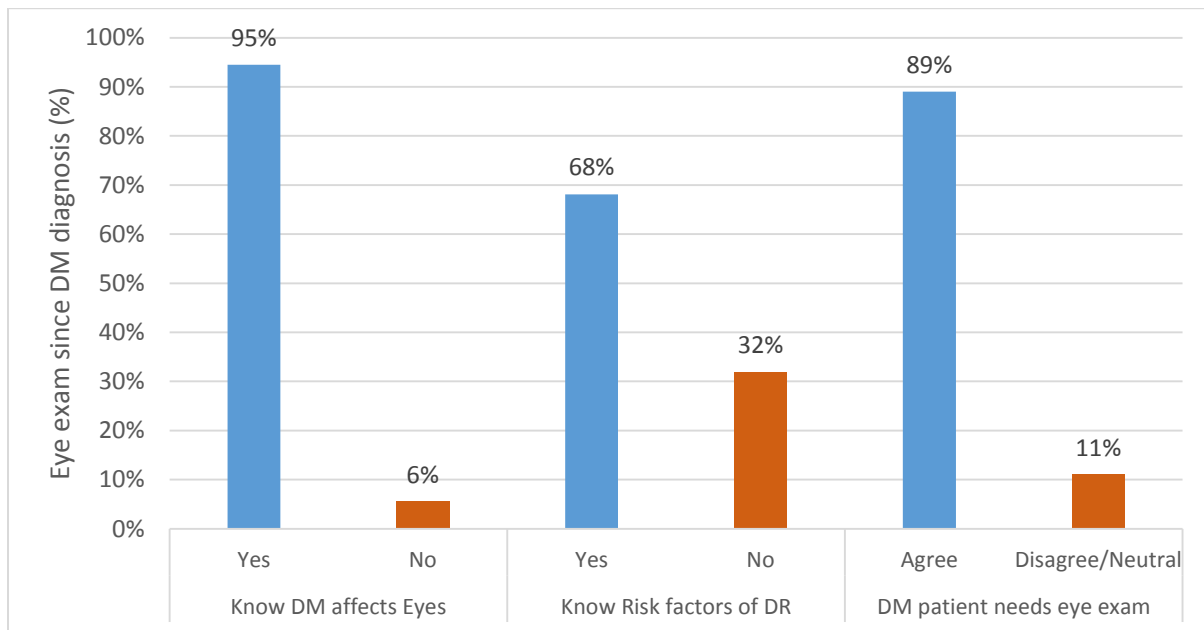


Table 9: Factors Affecting the Practice of Eye Examination

Variable	Eye Exam (n = 91)	No Eye Exam (n = 82)
<b>Age</b>		
Mean (SD)	53.22 (13.41)	42.41 (16.67)
<b>Sex</b>		
Male	50 (54.9)	25 (30.5)
Female	41 (45.1)	57 (69.5)
<b>Marital Status</b>		
Single	3 (3.3)	19 (23.2)
Married	69 (75.8)	58 (70.7)
Widowed	15 (16.5)	2 (2.4)
Separated/Divorced	4 (4.4)	3 (3.7)
<b>Occupation</b>		
Formal Employment	23 (25.3)	10 (12.2)
Casual Laborer	8 (8.8)	10 (12.2)
Merchant/Business	10 (11.0)	3 (3.7)
Farmer	16 (17.6)	38 (46.3)
Unemployed	34 (37.4)	15 (18.3)
Student	0 (0.0)	6 (7.3)
<b>Residence</b>		
Urban	56 (61.5)	27 (32.9)
Rural	35 (38.5)	55 (67.1)
<b>Level of Education</b>		
No Schooling	27 (29.7)	39 (47.6)
Primary	29 (31.9)	20 (24.4)
Secondary	15 (16.5)	13 (15.9)
Tertiary	20 (22.0)	10 (12.2)
<b>Income (USD.)</b>		
≤26	31 (34.1)	45 (54.9)
27-72	17 (18.7)	12 (14.6)
73-139	19 (20.9)	17 (20.7)
140-228	11 (12.1)	8 (9.8)
229-339	8 (8.8)	0 (0.0)
340-474	2 (2.2)	0 (0.0)
≥474	3 (3.3)	0 (0.0)

Higher level of eye examination was seen in those who were older, males, widowed, unemployed and urban dwellers. Farmers and those with no schooling were found to have low practice of eye examination.

Figure 8: Association of Practice with Knowledge and Attitude (N=91)



Most of those who had eye examinations were found to be those with knowledge that DM affects the eyes. But despite this finding, 41% (58) of those who knew that DM affects the eyes still did not go for eye examination. Around 68% of those who had an eye exam were found to have knowledge on risk factors of DR and positive attitude on the need for eye screening.

Table 10: Factors associated with Attitude on Eye exam

Variables	Attitude on Eye Examination		
	Negative	Neutral	Positive
<b>Sex of Respondent</b>			
Female	4 (19.0%)	4 (36.4%)	67 (47.5%)
Male	17 (81.0%)	7 (63.6%)	74 (52.5%)
<b>Age category of respondents</b>			
Mean	48.6	52.1	49.1
<b>Residence</b>			
Urban	8 (38.1%)	2 (18.2%)	73 (51.8%)
Rural	13 (61.9%)	9 (81.8%)	68 (48.2%)
<b>Occupation</b>			
Formal Employment	1 (4.8%)	1 (9.1%)	31 (22.0%)
Casual laborer	4 (19.0%)	2 (18.2%)	12 (8.5%)
Merchant / Business	3 (14.3%)	1 (9.1%)	9 (6.4%)
Farmer	8 (38.1%)	4 (36.4%)	42 (29.8%)
Unemployed	5 (23.8%)	2 (18.2%)	42 (29.8%)
Student	0 (0.0%)	1 (9.1%)	5 (3.5%)
<b>Income of Respondents (USD)</b>			
≤26	15 (71.4%)	7 (63.6%)	54 (38.3%)
27-72	2 (9.5%)	1 (9.1%)	26 (18.4%)
73-139	1 (4.8%)	1 (9.1%)	34 (24.1%)
140-228	3 (14.3%)	1 (9.1%)	15 (10.6%)
229-339	0 (0.0%)	1 (9.1%)	7 (5.0%)
340-474	0 (0.0%)	0 (0.0%)	2 (1.4%)
>474	0 (0.0%)	0 (0.0%)	3 (2.1%)
<b>Duration of Diabetes Illness in Years</b>			
≤1	3 (14.3%)	2 (18.2%)	26 (18.4%)
1-≤2	1 (4.8%)	1 (9.1%)	17 (12.1%)
2-≤5	7 (33.3%)	5 (45.5%)	38 (27.0%)
5-≤10	5 (23.8%)	2 (18.2%)	30 (21.3%)
≥10	5 (23.8%)	1 (9.1%)	30 (21.3%)

No significant association was seen with attitude and the above variables.

## 5.0 CHAPTER FIVE: DISCUSSION

This study had 173 participants with majority of the respondents, 98(56.6%), being males. The mean age of participants was 49.16 ( $\pm 15.48$ ) and 73 (42.2%) have had DM for > 5 years. This correlates with the global figure of higher male to female ratio and age ranges of diabetes disease reported in the IDF Diabetes Atlas <sup>2</sup>. A similar trend was also shown by a previous study done in Jimma by Worku D et al.<sup>46</sup>. Most of the respondents lived in the rural areas of the region, 90 (52%), and farmers constituted 54 (31.2%) of the respondents. Although Jimma is an urban town, the hospital is a referral center with a large catchment area which is mostly rural. Most of the respondents in this study were in a low income bracket earning less than 600 birr per month (26 USD). Majority ,107(62%), had primary or higher level of schooling which is higher than the country's literacy rate recorded by UNESCO at 49.1% in 2015.

Out of the 173 patients who participated in this study 149 (86.1%) knew that diabetes affects the eye while 141 (81.5%) knew it can cause blindness. Similar to most other studies done among patients assessing KAP on DR e.g. Krishna et al in Malaysia<sup>35</sup>, Memnon et al in Karachi <sup>47</sup> and Thapa et al in Nepal, participants who knew that DM affects eyes were considered to have a general awareness of Diabetic Retinopathy. The level of knowledge found in our study that DM causes eye disease was comparable to the knowledge level found in a hospital based study done by Mohammed I et al. in Kano , Nigeria<sup>37</sup> at 80.5%, but less than the 95% shown in a similar study done by Cheruioyt et al. in Kenya<sup>39</sup>. From amongst those who knew the blinding effects of diabetes, 34 (22.8%) were able to name DR as the condition specifically caused by DM in the eye and 10 (6.7%) correctly defined the changes that DR causes in the eyes. In the study by Cheruioyt et al.<sup>39</sup> more patients were able to explain the changes in DR, 46 (22.7%), than name DR, 21 (10.9%). In our study, it was apparent that most patients knew about the possibly blinding complication of DM. But very few were able to define the disease process of DR as this requires some knowledge of the eye anatomy which most patients are not likely to have.

The knowledge that DM affects the eyes was found to be slightly higher in those with higher education, income and longer duration of disease. This was similar to the study done by PK Rani et al<sup>34</sup> in rural India also found that knowledge on DR was high in those with high level of income and education and Thapa et al<sup>49</sup> which found literacy to be significantly related to

knowledge. Longer duration of diagnosed disease means that patients had more visits to the DM clinic where exposure to information on DR is likely to increase. There was an unsatisfactory level of knowledge on the risk factors of DR; poorly controlled blood sugar 68 (45.6%) and long duration of diabetes 37 (24.8%) were the most known risk factors. But an alarmingly small percentage of respondents were aware that hypertension, obesity, pregnancy and smoking were indeed risk factors for developing DR. These results were comparable to the study by Cheruiyot et al.<sup>39</sup> but different from the study done by Mirdula P et al. in India<sup>36</sup> in which duration of diabetes disease was the most known risk factor, 120 (60%). Furthermore, both studies showed a low level of awareness on hypertension, obesity and pregnancy being risk factors for the development of DR.

There is enough evidence shown in many studies including our study, that practice of patients towards DR is associated with the knowledge and attitude of patients towards the disease. Our study found that patients with the knowledge of risk factors of DR had an increased practice of eye examination. The knowledge on DR is imperative as it affects the health seeking behavior of the patients; in this case the visit to an eye doctor and may also help urge patients make better effort to change their modifiable risk factors. In our study the commonest source of information on the effect of DM on the eyes was the DM clinic environment, i.e. following physicians and nurses similar to the studies by Thapa et al.<sup>49</sup> and Mohammed et al.<sup>37</sup>. As these clinics are the first check point of the DM patients, it is important to carefully craft the health education given in these stations in a way that patients get and retain the most important information they need in order to improve their practice on DR.

Even though knowledge an important step towards better practice, as shown in our study and others, there are other factors affecting the practice of getting eye exam. Despite the high level of knowledge on the need of an eye exam among those with awareness of DR, 41% (58) never went for eye examination since their diagnosis of DM. The study done by Krishna RA et al.<sup>47</sup> in Malaysia revealed similar results where patients failed to go for eye exams despite having of knowledge of blinding DM complication. This implicates the presence of other driving factors, one of which may be low referral rate. The referral rate to an eye doctor was found to be 54% (94) in our study. Out of those patients who had an eye exam, only 15(8.67%) patients went to see an eye doctor on their own without being referred by their following doctor. A higher rate of referral and examination was reported by Cheruiyot et

al.,<sup>39</sup> 118(61.1%) but the study done in Kano, Nigeria by I Mohammed et al<sup>37</sup> reported a much lesser rate of eye examination at 15.7%. In our study, the most common reasons for not getting an eye exam were not thinking it was necessary, 43 (49.5%) (i.e. no eye complaints or didn't know that DM affects the eyes) and not having been referred by their physician, 35 (40.3%). Despite their awareness about blinding complications of DM, patients often do not take the initiative to get their eye examination and heavily rely on their doctor's recommendation to actually go for an eye examination. This highlights the need for doctors to not only pass the information but to individually refer patients to ensure that all in need of a dilated eye examination get one and are followed up regularly.

More than half of the women who were known to be diabetic during their pregnancy did not have an eye examination. The alarmingly low level of awareness about pregnancy as a risk factor for DR may have been one of the reasons for the poor practice. This emphasizes on the fact that education about DR should not be limited to the DM and Eye clinics but rather extend to the antenatal care givers too who will have wider contact with diabetic expecting mothers. Setting eye exam as a requirement for Diabetic mothers during their ANC follow up might also ensure the screening out of a possible progressive DR during pregnancy.

The ultimate goal of improving the knowledge about DR among diabetic patients is to improve their practices towards preventing or detecting the sight threatening ocular complications of DM. There were many participants who were not aware of the need for immediate eye screening upon diagnosis. The finding that only about 54% of those who said to have had an eye exam after their DM diagnosis had a dilated fundus exam also highlights another point that patients need to be made aware or given direction about the kind of eye exam they need and who to go to. With regards to knowledge on treatments of DR, 113 (75.84%) respondents were aware that DR can be treated but fewer, 33 (29.02%), were able to mention at least one mode of treatment, surgery being the most known option. This is a remarkably lower knowledge level on prevention and treatment of DR when compared to the study done by Cheruiyot et al<sup>39</sup> in Kenya and P.K Rani et al<sup>34</sup> in India. In our study most of the respondents who knew about modes of treatment for DR, 23 (69.69%), had been reviewed by an eye doctor. This suggests that knowledge on treatment of DR was most likely acquired from the eye clinic environment rather than their DM follow up clinic. About 23% (65) of the patients didn't know and 22% (28) had a negative attitude towards good blood sugar control being an important in preventing blinding DR.

Higher practice of eye examination was seen in older and married patients similar to the study by Cheruiyot et al.<sup>39</sup>. It was also significantly higher in males and urban dwellers possibly because there is a higher level of education in the two as found in this study. Most of those with low income were seen not to have had an eye exam but the study also showed that majority who were examined were unemployed. This might be explained by the fact that in our study, unemployed category includes housewives, retired pensioners etc..., who still have some income. They may also have more time to follow clinics other than the DM follow up clinic, playing a role in the better practice of eye exam seen in the unemployed group. Although not sighted as the main reason for not having eye exam, living in an area which is further from the urban setting of the hospital might have factored in the low eye exam practice among farmers and patients from rural areas of the region. Furthermore, knowledge of effect of DM on the eyes, its risk factors and the strong attitude regarding importance of screening has showed to result in a better practice of eye screening in our study.

## 6.0 CHAPTER SIX: CONCLUSIONS

- i.** Knowledge that diabetes affects the eye and can cause blindness was (86.1%) and (81.5%) respectively. This was not seen different amongst different age groups, sex, and level of education or income. Source of knowledge was mainly the DM clinic environment.
- ii.** Only 34 (22.8%) were able to name DR. Ability to describe the disease process in DR, 10(7.1%), was significantly increased in those with higher income, higher education level and urban residence.
- iii.** About 46% of all patients and 52% of mothers who were known to be diabetic during their last pregnancy had an eye exam. Lack of personal motivation to get an eye exam was seen despite knowledge of DR.
- iv.** Practice of seeking an eye exam was higher in older patients, males, widowers, unemployed and urban residents. Those with knowledge of DM effect in the eye, its risk factors and those with strong attitude towards screening had were seen to get eye exams more.



## **7.0 CHAPTER SEVEN: RECOMMENDATIONS**

- i.** There is need to improve the knowledge of diabetic patients about DR risk factors, prevention and screening. Emphasis on prevention and timely screening may result in a better practice of seeking eye screening for DR.
- ii.** Treating physicians should play a better role in making sure patients get eye screening. They can do this by referring and following up on their regular eye checkups possibly by recording and keeping track of their due eye examinations.
- iii.** Steps should be taken to increase the convenience of the diabetic patients to getting eye screening, eg. Assigning a person to do eye screenings or a fundus camera in the diabetic follow up clinic.
- iv.** The ANC follow up and obstetric clinics should be included in strategies to prevent blinding DR since they have are the key health contact to diabetic mothers.

## 8.0 CHAPTER EIGHT: STUDY LIMITATION

- i. Since participants are not English speakers and are not medical professionals, it was difficult to find exact translations of medical/technical terms and instead different phrases had to be used. E.g. **Retina** = “**The back part inside the eye**”
- ii. It was difficult for some patients to state their exact monthly income because of cultural inhibitions and fluctuating or inconsistent income etc.
- iii. Since Type I and Type II patients were not separated during the analysis, Type I patients whose recommended eye exam time has not reached (5 year), may have been included in patients who didn't have an eye exam.

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# APPENDICES

## Appendix I: Questionnaire

### Biodata

1. Code number.....

#### 2. Sex

1. Female
2. Male

3. Age\_\_\_\_\_

#### 4. Marital status

1. Single
2. Married
3. Widowed
4. Separated/Divorced

5. Occupation.....

6. Residence.....

#### 7. Education level

1. No formal education
2. Primary
3. Secondary
4. Tertiary (College/University)

#### 8. Income level

1. 0-600 Br
2. 601-1650 Br
3. 1651-3200 Br
4. 3201-5250 Br
5. 5251-7800 Br
6. 7801-10900 Br
7. >10,900 Br

**9. How long have you been diabetic?**

1.  $\leq 1$  year
2. 1 -  $\leq 2$  years
3. 2 -  $\leq 5$  years
4. 5 -  $\leq 10$  years
5.  $> 10$  years

**Knowledge on Diabetic retinopathy**

**1. Does diabetes affect the eye?**

1. Yes
2. No
3. Don't know

**2. Can diabetes cause blindness?**

1. Yes
2. No
3. Don't know

**(If answered "No" to both the above questions, please skip to question #13)**

**3. What eye condition does diabetes specifically cause in the eyes?**

1. Diabetic retinopathy
2. Cataract
3. Glaucoma
4. Don't know
5. Others

**4. What is diabetic retinopathy?**

1. It is the same as cataract.
2. It is high sugars in the eye.
3. It is changes in the blood vessels of the retina due to diabetes
4. It is high pressure in the eye
5. Don't know
6. Other (specify)\_\_\_\_\_

**5. What are the risk factors for developing diabetic retinopathy?** (You can choose more than one answer)

1. Poorly controlled blood sugar
2. Duration of diabetes
3. Hypertension
4. High BMI
5. Pregnancy
6. Smoking
7. I Don't know

**6. Is blindness from diabetic retinopathy preventable?**

1. Yes
2. No
3. Don't know

**(If answered "No" to the above question, please skip to question #8)**

**7. Is blood sugar control important in preventing blindness from diabetic Retinopathy?**

1. Yes
2. No
3. Don't know

**8. Is diabetic retinopathy treatable?**

1. Yes
2. No
3. Don't know

**(If answered "No" to the above question, please skip to question #10)**

**9. What are the treatment options available for diabetic retinopathy?**

**(You can chose more than one answer)**

1. Intravitreal injections (Injections inside the eyes)
2. Laser burns inside the eyes
3. Surgery
4. Other
5. Don't know

**10. Should a person with diabetes mellitus visit a specialist eye doctor following diagnosis?**

1. Yes
2. No
3. Don't know

**(If answered "No" to the above question, please skip to question #12)**

**11. How soon after the diagnosis has been made should that person visit the specialist eye doctor?**

1. Immediately after diagnosis of DM
2. One year after diagnosis
3. Five years after diagnosis
4. Other \_\_\_\_\_

**12. Does a diabetic patient need a regular eye checkup?**

1. Yes
2. No
3. I don't know

**13. What kind of an eye examination does a diabetic patient need to diagnose Diabetic Retinopathy?**

1. Vision
2. Checking for eye glasses
3. Dilated examination of the back of the eye
4. Slit-lamp/ torch examination of anterior part of the eye
5. Other .....

**14. Have you been diagnosed with diabetic retinopathy?**

1. Yes
2. No
3. Don't know

**15. How did you come to know about DM affecting the eyes?**

1. Health professional at the diabetes follow up clinic
2. Ophthalmologist/Optomtrist/optician
3. Eye camp
4. Family member/relative/friend with diabetes
5. TV, magazines, other media
6. Other(specify):

**Practices**

**16. Have you ever been referred to see an eye doctor?**

1. Yes
2. No
3. Don't know

**17. Have your eyes been examined by an eye doctor after the diagnosis of Diabetes?**

1. Yes
2. No
3. Don't know

**(If answered "No" to the above question, please skip to question #20)**

**18. If "Yes" how many times in the last one year?**

1. None
2. Once
3. Twice
4. Three times or more

**19. What kind of eye exam did you get?**

1. Vision
2. Checking for eye glasses
3. Dilated examination of the back of the eye
4. Slit-lamp/ torch examination of anterior part of the eye
5. Other .....

**20. If "No" to question #17, why? (Explain each answer)**

1. I did not think it was necessary
2. I was not advised to by my doctor
3. Financial restrictions
4. Lack of convenient facility
5. Others (Specify)

**21. Did you see an eye doctor for eye examination when you were last pregnant?**

1. Yes
2. No
3. I don't know
4. Does not apply

**22. If "No" to question #21, why?**

1. I did not think it was necessary
2. I was not advised to by my doctor
3. Financial restrictions
4. Lack of convenient facility
5. Others (Specify)

**23. Do you regularly check your blood sugar?**

1. Yes
2. No
3. I don't know

**If yes, how often?** \_\_\_\_\_

**24. If "No" to question #23, why? (Please explain each answer)**

1. I do not think it is necessary
2. I was not advised to by my doctor
3. Financial restrictions (How much do you spend in each visit)
4. Lack of convenient facility (How far is the facility to you)
5. Others (Specify)

**25. Do you regularly check your blood pressure?**

1. Yes
2. No
3. I don't know

**If yes, how often do you check?** \_\_\_\_\_

**26. If "No" to question #25, why? (Please Explain each answer)**

- 1 I do not think it is necessary
- 2 I was not advised to
- 3 Financial restrictions (How much do you spend in each visit)
- 4 Lack of convenient facility (How far is the facility to you)
- 5 Others (Specify)

**27. Which of the following do you regularly do?**

1. I smoke cigarette
2. I exercise
3. I follow a diabetes friendly diet
4. I follow my diabetic clinic

**Attitudes**

For each of the questions below indicate whether you strongly disagree, moderately disagree, neutral, moderately agree, strongly agree

**28. Diabetic patients should have an eye examination.**

1. Strongly disagree
2. Moderately disagree
3. Neutral
4. Moderately agree
5. Strongly agree

**29. Eye examination is required in diabetic patients even when vision is not affected.**

1. Strongly disagree
2. Moderately disagree
3. Neutral
4. Moderately agree
5. Strongly agree

**30. Newly diagnosed diabetic patients require eye checkups.**

1. Strongly disagree
2. Moderately disagree
3. Neutral
4. Moderately agree
5. Strongly agree

**31. Good Blood sugar control is important in preventing blinding diabetic retinopathy.**

1. Strongly disagree
2. Moderately disagree
3. Neutral
4. Moderately agree
5. Strongly agree

**32. Good Blood pressure control is important in preventing blinding diabetic retinopathy.**

1. Strongly disagree
2. Moderately disagree
3. Neutral
4. Moderately agree
5. Strongly agree

**33. A pregnant diabetic mother should see an eye doctor for examinations**

1. Strongly disagree
2. Moderately disagree
3. Neutral
4. Moderately agree
5. Strongly agree

**34. Treatment can prevent blinding complications of diabetic retinopathy.**

1. Strongly disagree
2. Moderately disagree
3. Neutral
4. Moderately agree
5. Strongly agree



## **Appendix II: Informed Consent Form (English)**

My name is Dr. Aida Sraj. I am a student in the Master's program in Ophthalmology of University of Nairobi, Kenya. I am conducting a study as a partial fulfillment of my study. I kindly request your participation in my study.

### **Title of the study**

Knowledge, Attitudes and Practices On Diabetic Retinopathy Among Patients Attending The Diabetes Clinic At Jimma Specialized University Hospital, South Western Ethiopia

### **What the study is about**

This study is trying to find out what knowledge, attitude and practices that diabetic patients have regarding Diabetic Retinopathy (eye disease in diabetic patients).

### **What you will be asked to do**

You will be required to fill in a questionnaire with 29 questions including a few personal detail questions. This will take approximately 20 minutes of your time.

### **Risks and benefits**

There is no risk or monetary benefit related to your participation in this study. Participating in this study will help the researcher determine the level and affecting factors of knowledge, attitude and practice of diabetic patients about Diabetic Retinopathy. The findings of the study will be presented to the hospital and possibly other institutions as well. This will improve patient management

### **Participation**

Taking part in this study is completely voluntary. If you choose to be in the study you can withdraw at any time without consequences of any kind. Participating in this study does not mean that you are giving up any of your legal rights.

### **Anonymity and Confidentiality**

You are not required to give your name or any identification information for this study. You will only be given a participant code number. The records of this study will be kept private. They will be entered in a password protected database with access limited to only the researcher and selected research assistants and the papers kept in a locked drawer. All records will be destroyed after analyzing the data.

### **Compensation and referrals**

There will be no compensation for participating in this study.

If you have questions concerning your participation in the study you may contact the researcher and the ethics committee at the email address or phone number below:

#### **Dr Aida Sraj**

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You will be given a copy of this form to keep for your records.





5.  $\geq 10$  ዓመት

በስኳር ምክንያት ስለሚከሰቱ የሬቲና(የአይን የጀርባ ክፍል) ችግር ዙሪያ

1. የስኳር ህመም አይንን ይጎዳል?

- 1. አዎ ይጎዳል
- 2. አይጎዳም
- 3. አላውቅም

2. የስኳር ህመም አይነሰውርነትን ሊያስከትል ይችላል?

- 1. አዎ ይችላል
- 2. አይችልም
- 3. አላውቅም

(ለተቋቋሙ ጥያቄ "2" መልሶ "አይችልም" ከሆነ እባክዎትን ወደ ጥያቄ ተቋቋሙ 13 ይሂዱ)

3. የስኳር ህመም የሚያስከትለው የትኛውን አይነት የአይን ህመም ነው ?

- 1. የሬቲና (የአይን ጀርባ ክፍል ) ችግር
- 2. የአይን ሞራ ግርዶሽ አይነት ነው
- 3. ግላኮማ (የአይን ውስጥ ግፊት መጨመር )
- 4. ሌላ \_\_\_\_\_
- 5. አላውቅም

4. በስኳር ህመም ምክንያት የሚመጣ የሬቲና (የአይን የጀርባ ክፍል) ችግር ምንድን ነው ?

- 1. የአይን ሞራ ግርዶሽ አይነት ነው
- 2. የአይን ውስጥ የስኳር መጠን ከፍ ማለት ነው
- 3. በሬቲና ላይ ያሉ የደምስሮች ችግር ነው
- 4. የአይን ውስጥ ግፊት መጨመር ነው
- 5. አላውቅም
- 6. ሌላ \_\_\_\_\_

5. የስኳር ህመምን ተከትሎ የሚመጣ የሬቲና (የአይን የጀርባ ክፍል) ችግርን የሚያስከትሉ ነገሮች ምንድን ናቸው?

(ከአንድ በላይ መልስ መምረጥ ይቻላል)

- 1. በደም ውስጥ ያለው የደም የስኳር መጠን
- 2. ረጅም ጊዜ የቆየ የስኳር ህመም
- 3. የደም ግፊት
- 4. ከመጠን ያለፈ የሰውነት ውፍረት
- 5. እርግዝና
- 6. ሲጋራ ማጨስ

- 7. አላውቅም
- 6. በስኳር ህመም የሚመጣ ለአይነሰውርነት የሚዳርግ የሬቲና (የአይን የጀርባ ክፍል) ችግርን መከላከል ይቻላል?
  - 1. ይቻላል
  - 2. አይቻልም
  - 3. አላውቅም

(ለተቋጥሮ ጥያቄ 6 መልስ "አይቻልም" ከሆነ እባክዎትን ወደ ጥያቄተ.ቁጥር 8 ይሄዱ )

- 7. የደም ስኳር መጠንን መቆጣጠር ለአይነሰውርነት የሚዳርግ የሬቲና (የአይን የጀርባ ክፍል) ችግርን ይከላከላል?
  - 1. ይከላከላል
  - 2. አይከላከልም
  - 3. አላውቅም
- 8. በስኳር ህመም የሚከሰትን የሬቲና (የአይን የጀርባ ክፍል) ችግርን ማከም ይቻላል?
  - 1. ይቻላል
  - 2. አይቻልም
  - 3. አላውቅም

(ለተቋጥሮ ጥያቄ 8 መልስ "አይቻልም" ከሆነ ወደ ጥያቄተ.ቁጥር 10 ይሄዱ)

- 9. በስኳር ህመም የሚከሰትን የሬቲና (የአይን የጀርባ ክፍል) ችግርን በምን ማከም ይቻላል? (ከአንድ በላይ መልስ መምረጥ ይቻላል)
  - 1. የአይን ውስጥ መርፌ
  - 2. በጨረር
  - 3. ቀዶ ሕክምና
  - 4. ሌላ \_\_\_\_\_
  - 5. አላውቅም
- 10. በስኳር ህመም ተጠቂ መሆኑን ያወቀ ሰው የአይን ምርመራ ማድረግ አለበት?
  - 1. አዎ
  - 2. አይ
  - 3. አላውቅም

(ለተቋጥሮ ጥያቄ 10 መልስ "አይ" ከሆነ ወደ ጥያቄተ.ቁጥር 12 ይሄዱ)

- 11. አንድ ሰው የስኳር ህመምተኛ መሆኑን ባወቀ በስንት ጊዜ ውስጥ የአይን ምርመራ ማድረግ አለበት?
  - 1. ወድያውኑ
  - 2. በአንድ ዓመት ውስጥ
  - 3. በአምስት ዓመት ውስጥ

4. ሌላ \_\_\_\_\_
12. የስኳር ህመም ያለበት ሰው በየጊዜው የአይን ምርመራ ማግኘት ያስፈልገዋል?
1. አዎ ያስፈልገዋል
  2. አያስፈልገውም
  3. አላውቅም
13. በስኳር ህመም ምክንያት የሚመጣን የሬቲና ሕመምን ለማግኘት ምን አይነት የአይን ምርመራ መሆን አለበት?
1. የአይን የአይታ ደረጃ ምርመራ
  2. የመነፅር አስፈላጊነት ምርመራ
  3. የአይንን የጀራባ ክፍል በመሳሪያ መመርመር
  4. የአይንን የፊት ለፊት ክፍል በማክሮስኮፕ ወይም በባትሪ መመርመር
  5. ሌላ \_\_\_\_\_
14. በስኳር ህመም የሚከሰት የሬቲና(የአይን የጀርባ ክፍል) ችግር አለብዎት?
1. አለብኝ
  2. የለብኝም
  3. አላውቅም
15. በስኳር ህመም ምክንያት ስለሚከሰት የሬቲና(የአይን የጀርባ ክፍል) ችግር እንዴት አወቁ (ከየትሰሙ)?
1. የስኳር ህመም የከትትል ክፍል
  2. ከአይን ሃኪም
  3. ከአይን ህክምና ዘመቻ ወቅት
  4. የስኳር ህመም ካለበት ዘመድ፣ጓደኛ ወዘተ
  5. ከመገናኛ ብዙኃን (ሬዲዮ፣ቴሌቪዥን፣ጋዜጣ.....)

ሌላ \_\_\_\_\_

ከስኳር ህመም የሚመጡ የሬቲና (የአይን የጀርባ ክፍል) ችግርን በተመለከተ የሚደረጉ ክንውኖች

16. የአይን ሃኪም እዲያዩ በሃኪሞች ተልከዋል?
1. አዎ
  2. አልተላኩም
  3. አላውቅም
17. የስኳር ህመም እንዳለበት ካወቁ በኋላ አይኖችዎን በአይን ሃኪም ተመርምረው ያውቃሉ?
1. አዎ
  2. አይ
  3. አላውቅም

(ለተቁጥርጥያቱ17መልሱ"አይ" ከሆነእባክዎትንወደጥያቄተቁጥር20ይሂዱ)

18. ባለፈው አንድ አመት ውስጥ ስንት ጊዜ ዓይኖችዎን ተመርመሩ?

1. ምንም ጊዜ
2. አንድ ጊዜ
3. ሁለት ጊዜ
4. ሶስቱና ከዛ በላይ

19. ምን አይነት የአይን ምርመራ ተደርጎለት?

1. የአይታ ደረጃ ምርመራ
2. የመነፅር አስፈላጊነት ምርመራ
3. የአይን ጀርባ ክፍል ምርመራ
4. የአይን የፊት ክፍል በማይክሮስኮፕ (በባትሪ) ምርመራ
5. ሌላ \_\_\_\_\_

20. ለጥያቄተ.ቁጥር “17” መልሱት “አላውቅም” ከሆነ ለምን?

1. አስፈላጊ አልመሰለኝም
2. ተመርመር/ሪ የሚል ምክር ከሃኪም አላገኘሁም
3. በገንዘብ ችግር
4. ምቹ የሆነ የጤና ተቋም ስላላገኘሁ
5. ሌላ \_\_\_\_\_

21. ባለፈው የእርግዝናዎ ወቅት የአይን ምርመራ አድርገዋል?

1. አዎ
2. አላደረሁም
3. አላስታውስም
4. እኔን አይመለከትም(ወንድያታ/ በእርግዝና ወቅት የስኳር አልነበረብኝም)

ለጥያቄ ቁጥር “21” መልሱ “እኔን አይመለከትም” ከሆነ ወደ ጥያቄ ቁጥር “23” ይለፉ.

22. በተ.ቁጥር “21” ጥያቄ መልሱ “አላደረሁም” ከሆነ ለምን ?

1. አስፈላጊ አልመሰለኝም
2. መመርመር እንደነበረብኝ በሀኪም አልተነገረኝም
3. በገንዘብ ችግር
4. ምቹ የሆነ የጤና ተቋም ስላላገኘሁ
5. ሌላ \_\_\_\_\_

23. የደም የስኳር መጠንዎን በየጊዜው ይመረመራሉ?

1. አዎ
2. አልመረመርም
3. አላውቅም

ለጥያቄው መልሱ አዎ ከሆነ በየስንት ጊዜው መረመራሉ? \_\_\_\_\_



24. ለጥያቄተ.ቁጥር “23” መልሶ” አልመረመርም "ከሆነለምን ? (አባኩትን መልሶትን ያብራሩ)

1. አስፈላጊ አልመሰለኝም
2. መመርመር እንደነበረብኝ በሀኪም አልተነገረኝም
3. በገንዘብ ችግር
4. ምቹ የሆነ የጤና ተቋም ስላላገኘሁ
5. ሌላ \_\_\_\_\_

25. የደም ግፊት መጠንዎን በየጊዜው ይመረመራሉ?

1. አዎ
2. አልመረመርም
3. አላውቅም

ለጥቆው መልሶ አዎ ከሆነ በየሰንት ጊዜው መረመራሉ? \_\_\_\_\_

26. ለጥያቄተ.ቁጥር “25” መልሶ” አልመረመርም "ከሆነለምን ? (አባኩትን መልሶትን ያብራሩ)

6. አስፈላጊ አልመሰለኝም
7. መመርመር እንደነበረብኝ በሀኪም አልተነገረኝም
8. በገንዘብ ችግር
9. ምቹ የሆነ የጤና ተቋም ስላላገኘሁ
10. ሌላ \_\_\_\_\_

27. ከሚከተሉት ውስጥ የትኞቹን በየጊዜው ይተገብራሉ?

1. ሲጋራ አጨሳለሁ፡፡
2. የአካል ብቃት እንቅስቃሴ አደርጋለሁ፡፡
3. ለስኳር ታማሚ ተገቢ የሆነ አመጋገብ አከተላለሁ
4. የ ስኳር ህመም ክትትሌን በተገቢው ጊዜ አደርጋለሁ፡፡

በስኳር ህመም ምክንያት የሚመጣ የፊትና (የአይን የጀርባ ክፍል) ችግርን ለተመለከተ ያለ አመለካከት

(እባክዎትን እያንዳንዱ ዓረፍተ ነገር ከሰራቸው በተዘረዘሩት ምርጫዎች መሰረት ያሉትን የአመለካከት ጥንካሬ ያመልክቱ)

28. የስኳር በሽታ ታማሚዎች የዓይን ምርመራ ያስፈልጋቸዋል፡፡

1. በጣም አልሰማም
2. በመጠኑ አልሰማም
3. ምንም አመለካከት የለኝም
4. በመጠኑ እሰማለሁ
5. በጣም እሰማለሁ

29. ማንኛው የስኳር በሽታ ታማሚ እይታው ባይቀንስም እንኳን፣ ዓይን መርመር ይገባዋል፡

- 1. በጣም አልሰማማም
- 2. በመጠኑ አልሰማማም
- 3. ምንም አመለካከት የለኝም
- 4. በመጠኑ እስማማለሁ
- 5. በጣም እስማማለሁ

30. አዲስ የስኳር ህመም ተጠቂ የሆነ ግለሰብ የአይን ምርመራ ያስፈልገዋል፡፡

- 1. በጣም አልሰማማም
- 2. በመጠኑ አልሰማማም
- 3. ምንም አመለካከት የለኝም
- 4. በመጠኑ እስማማለሁ
- 5. በጣም እስማማለሁ

31. ጥሩ የደም የስኳር መጠን ቁጥጥር በስኳር ህመም ምክንያት የሚከተልና የሬቲና (የአይን የጀርባ ክፍል) ችግርን ይከላከላል፡፡

- 1. በጣም አልሰማማም
- 2. በመጠኑ አልሰማማም
- 3. ምንም አመለካከት የለኝም
- 4. በመጠኑ እስማማለሁ
- 5. በጣም እስማማለሁ

32. ጥሩ የደም ግፊት ቁጥጥር በስኳር ህመም ምክንያት የሚከተልን የሬቲና (የአይን የጀርባ ክፍል) ችግርን ይከላከላል፡፡

- 1. በጣም አልሰማማም
- 2. በመጠኑ አልሰማማም
- 3. ምንም አመለካከት የለኝም
- 4. በመጠኑ እስማማለሁ
- 5. በጣም እስማማለሁ

33. ማንኛውም የስኳር ህመም ተጠቂ የሆነች ሴት በእርግዝና ወቅት የአይን ምርመራ ማድረግ አለባት፡፡

- 1. በጣም አልሰማማም
- 2. በመጠኑ አልሰማማም
- 3. ምንም አመለካከት የለኝም
- 4. በመጠኑ እስማማለሁ
- 5. በጣም እስማማለሁ

34. ማከም በስኳር ህመም ምክንያት የሚከተልን የሬቲና (የአይን የጀርባ ክፍል) ችግርን ይከላከላል፡፡

- 1. በጣም አልሰማማም
- 2. በመጠኑ አልሰማማም
- 3. ምንም አመለካከት የለኝም
- 4. በመጠኑ እስማማለሁ

5. በጣም እስማማለሁ

እኔ የናይሮቢ ዩንቨርሲቲ የህክምና የደህረ ምረቃ ተማሪ ስሆን የምሰራውም ጥናት፣በስኳር ህመምተኞች እውቀት፣ግንዛቤ እና ተሞክሮዎች ላይ ያተኩራል።በዚህ ጥናት ላይ መሳተፍም በፍቃደኝነትዎ ብቻ ላይ የመሰረተ ሲሆን፣የሚሰጡትም መረጃ ለትምህርት፣ለጥናትና ምርመር ብቻ ይውላል። መረጃውን በሚሰጡበት ወቅትም ስምና አድራሻዎን መጥቀስ ወይም ማካተት አይጠቅብዎትም።ስላደረጉልኝ ትብብር ከልብ አመሰግናለሁ።

መግለጫ

እኔ \_\_\_\_\_ ከላይየተጻፈውን ማብራሪያ አንብቤና ተረድቼ በፍቃደኝነት በጥናቱ ላይ ለመሳተፍ ተስማምቻለሁ።

ፊርማ \_\_\_\_\_

**Appendix IV – The Amharic translation of the informed consent form.**

እኔ ዶ/ር አይዳ ስራጅ በናይሮቢ ዩኒቨርሲቲ በአፕላይድ ሳይንስና ቴክኖሎጂ የትምህርት ክፍል የድህረ ምረቃ ተማሪ ነኝ።ትምህርቴንምለማጠናቀቅ ለማሟያ ጥናት እየሰራሁ ነው።በመጀመርያም፤በምሰራውም ጥናት ስር በፈቃደኝነት እንዲሳተፉ ትብብርዎን በማክበር እጠይቃለሁ።

**የጥናቱአርእስት፤**

ጥናቱ፤

“በጅምስፔሻላይዝድሆስፒታልየስኳርህመምክሊኒክውስጥባሉተመላላሽታካሚዎችዘንድበስኳርህመምምክንያትስለሚመጣ ውየአይንየጀርባክፍልችግርዘርያየስኳርህመምተኞችያላቸውእውቀት፣ግንዛቤእናተሞክሮዎች” ይሰኛል።

**የጥናቱትኩረት፤**

ጥናቱበስኳርህመምምክንያትስለሚወጣው የአይን የጀርባ ክፍል ችግር የስኳር ህመም ታካሚዎች ባላቸው እውቀት፣ግንዛቤ እና ተሞክሮዎች ላይ ያተኩራል።

**እርሶ እንዲያደርጉልኝ የምጠይቅዎ፤**

የተዘጋጁትን ሃያዘጠኝ (29) ጥያቄዎችን በተሰጠዎት ቅጽ ላይ እንዲሞሉልኝ ነው።ከጥያቄዎቹም የተወሰኑት የእርስዎን ግለሰባዊ ዝርዝርመረጃዎችየሚጠይቁ ናቸው።ቅጹን የመሙላት ሂደትም በግምት ሃያ ደቂቃ (20) ያህል ጊዜ ይወስዳል።

**በዚህ ጥናት ውስጥ የመሳተፍ ጉዳቱና ጥቅሙ፤**

እዚህ ጥናት ላይ በመሳተፍም የሚያገኙት ምንም ዓይነት ጥቅማ ጥቅምአይኖርም።ነገር ግን በጥናቱ ላይ በመሳተፍም በስኳር ህመም ምክንያት የሚከሰተው የአይን የጀርባ ክፍል ችግር ዙሪያ ስላለው እውቀት፣ግንዛቤ እና ተሞክሮዎች ተመራማሪዎ በጥልቀት ተረድታ፤ግኝቶቹንምለሆስፒታሉና ለሚመለከታቸው ተቋማት በማቅረብ ወደፊት የበሽተኞች አያያዝ የበለጠ የሚሻሻልበትን ሁኔታ በማመቻቸት ሊረዳ ይችላል።

**ተሳትፎ፤**

በዚህ ጥናት ላይ መሳተፍ በርሶ ፈቃደኝነት ላይብቻ የተመሰረተ ነው።በጥናቱ ሂደት በየትኛውም ወቅት ከጥናቱ ተሳትፎ እራሰዎን ሊያገሉ ይችላሉ።በዚህ ጥናት መሳተፍዎም የትኛውንም ህጋዊ መብትዎን አያሳጣዎትም።

**በጥናቱየሚሰጡትመረጃሚሰጥራዊነት፤**

እዚህ ጥናት ስምዎንና ማንነትዎን የሚገልፁ መረጃዎችን ካልፈለጉ መስጠት አይጠበቅብዎትም።እርሶ የሚሰጡት መረጃ የኮድ ቁጥር ተሰጥቶት በጥንቃቄ ደህንነቱ በተጠበቀ መልኩ በሚሰጥር ቁልፍ ተቆልፎ የመረጃ ቋት ውስጥ ይቀመጣል።የወረቀት መረጃዎችም ቁልፍ በተበጀላቸው ሳጥን ውስጥ ይቀመጣሉ።መረጃዎቹም በተመራማሪዎና በተመረጡ ረዳቶቻቸው ብቻ አገልግሎት ላይ ይውላሉ።የተሰበሰቡት መረጃዎችም ከጥናቱ መጠናቀቅ በኋላ ጥንቃቄ በተሞላበት ሁኔታ ይደመሰሳሉ

**ጥናቱ ላይ በመሳተፍ የሚገኙ ክፍያና እና ጥቅማጥቅሞች፤**

እዚህ ጥናት ላይ በመሳተፍዎ ምንም አይነት ክፍያ ወይም ጥቅማጥቅም አያገኙም፡፡

በጥናቱ ስለነበርዎት ተሳትፎ ጥያቄዎች ካሉዎት ከታች በተዘረዘሩት አድራሻዎች ተመራማሪዎን እና የዩንቨርሲቲው የስነ-ምግባር ኮሚቴን ማግኘት ይችላሉ፡፡

**ተመራማሪዎን ለማግኘት፤**

**Dr Aida Sraj**

University of Nairobi Ophthalmology department  
Mobile Number: +251910348873 /+254727417724  
Email address: getsraida@gmail.com

**የዩንቨርሲቲውን የስነ-ምግባር ኮሚቴ ለማግኘት፤**

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የዚህ ቅጽ ኮፒ ለመረጃ ከእርስዎ ዘንድ ይቀመጣል፡፡

የስምምነት-መግለጫ እኔ ከላይ ስሜ ወይም መረጃዬ ከላይ የተዘረዘረው ከላይ የተዘረዘረሩትን መረጃዎች አንብቤና ተረድቼ፤-በሎም በጥናቱ የትኛውም ወቅት ከጥናቱ ሂደት እራሴን ለማግለል እንደምችል አውቄ በዚህ ጥናት ለመሳተፍ ተስማምቻለሁ።

በስምምነቴም መሰረት፤

የተሳታፊ ስም \_\_\_\_\_

ፊርማ \_\_\_\_\_

ቀን \_\_\_\_\_

የጥናቱ ተሳታፊ የጥናቱን ይዘት ተገንዝበው በጥናቱ ላይ እንደተሳታፉ አረጋግጣለሁ።

ዶ/ር አይዳ ስራጅ \_\_\_\_\_

ፊርማ \_\_\_\_\_

ቀን \_\_\_\_\_

## Appendix V – The Oromiffa translation of the Questionnaire

Ani Yunivarsiitii Naayiroobii Muummee Barnoota Yaalaatti barattuu Digirii Lammaffaa/Post Graduate/ yoo ta'u, qorannoon ani gaggeessubbeekumsa, hubannoo fi muuxannoo dhukkubsattoota dhibee sukkaara irratti kan xiyyeeffatedha. Qorannoo kana irratti fedhii keessan qofaan kan hirmaachuu qabdan yoo ta'u, odeeffannoo isin kennitan barumsaa fiqorannoo fi qo'annoofkan oluudha. Odeeffannoo yammuu kennitan maqaa fi teessoo keessan ibsuun isin irraa hin eeggamu. Deeggarsa gootaniif baayyee galatooma.

*Gaaffilee*

### Odeeffannoo Dhuunfaa

**Lakkoofsa Koodii** \_\_\_\_\_

**1. Saala**

1. Dhalaa
2. Dhiira

**2. Umurii** \_\_\_\_\_

**3. Haala Gaa'ila**

1. Kan hin fuune/heerumne
2. Kan fudhe/ heerumte
3. Haadh manaa/abbaan manaan irraa kan du'e
4. Kan addaan bahan

**4. Haala Hojii** \_\_\_\_\_

**5. Iddoo Jireenyaa** \_\_\_\_\_

**6. Sadarkaa barumsaa**

1. Kan hin baranne
2. Sadarkaa tokkoffaa
3. Sadarkaa lammaffaa
4. Sadarkaa sadaffaa (Koolleejii, Yunivarsiitii...)
- 5.

**7. Haala Galii (Qarshii/birrii)**

1.  $\leq 600$
2. 601-1,650
3. 1,651-3,200
4. 3,201-5,250
5. 5,251-7,800

**8. Dhibee sukkaaraa qabaachuu keessan erga beektanii hagam ta'a?**

1. Waggaa tokkoo fi isaa gadi
2. Waggaa 1- 2
3. Waggaa 2-5
4. Waggaa 5- 10
5. Waggaa kudhanii fi isaa ol

## **Sababa Dhibee Sukkaaraan rakkoo Ratiinaa/ Kutaa Duuba Ijaa/ dhufuu Ilaala**

**1. Dhibeen sukkaaraa ijaa ni miidhaa?**

1. Eeyyee, ni miidha,
2. Hin miidhu
3. Hin beeku

**2. Dhibeen sukkaaraa qarooijaa balleessuu ni danda'aa?**

1. Eyyee ni danda'a
2. Hin danda'u
3. Hin beeku

*(Gaaffii lakkoofsa "1" fi "2" deebiin keessan "hin miidhau/hin beeku" yoo ta'e, gara lakkoofsa "16"tti dabra.)*

**3. Dhibeen sukkaaraa dhibee ijaa isa kam fiduu danda'a?**

1. Rakkoo Ratiinaa/ Kutaa Duuba Ijaa/
2. Moora ijaa /Rakkoo leensii/
3. Gilaakoomaa/ dhiibbaa keessoo ijaa dabaluu /
4. Kan  
    biro\_\_\_\_\_
5. Hin beeku

**4. Rakkoo Ratiinaa dhibee sukkaaraan dhufu maaldha?**

1. Akka moora Ijaa dha.
2. Baayyina sukkaarakeessoo ijaa ol ka'uu dha.
3. Rakkoo hiddawwan dhiigaa Ratiinaa jiraniidha.
4. Dhiibbaa keessoo ijaa dabaluu dha.
5. Kan  
    biraa\_\_\_\_\_
6. Hin beeku



**5. Dhibee sukkaaraa hordofuun rakkoo Ratiinaa wantoota hordofsiisan maalfaadha?**

1. Baayyina sukkaaraa dhiiga keessa jiru
2. Dhibee sukkaaraa yeroo dheeraa ture
3. Dhiibbaa dhiigaa,
4. Baayyee dabaluuufurdina qaamaa,
5. Ulfa/Garaatti baachuu/
6. Sigaaraa xuuxuu
7. Hin beeku
8. Kan biroo \_\_\_\_\_

**6. Dhibee sukkaaraa hordofuun rakkoo Ratiinaan badiinsa ijaadhufu ittisuun ni danda'amaa?**

1. Ni danda'ama
2. Hin Danda'amu
3. Hin beeku

*(Gaaffii lakkoofsa "6" f deebiin keessan hin danda'amu yoo ta'e, gara lakkoofsa "8" tti dabraa)*

**7. Baayyina sukkaaraa dhiiga keessaa sirritti to'achuunrakkoo Ratiinaan badiinsa ijaa dhufu ni ittisaa?**

1. Ni ittisa
2. Hin ittisu
3. Hin beeku

**8. Dhibee sukkaaraan rakkoo Ratiinadhufu yaaluun ni danda'amaa?**

1. Ni danda'ama
2. Hin danda'amu
3. Hin beeku

*(Lakkoofsa "8" tiif deebiin keessan "hin danda'amu" yoo ta'e, gara lakkoofsa "10" tti dabraa)*

**9. Dhibee sukkaaraan rakkoo Ratiina dhufu akkamitti yaaluu danda'ama? (Deebii tokkoo ol kennuun ni danda'ama)**

1. Lilmoo ijakeessaafkennamuun,
2. Xiyyee/Carara/ leezaraan,
3. Baqaqsanii yaaluu
4. Hin beeku

**10. Namni dhibee sukkaaraan qabamuu isaa beeke qorannooijaa godhuuqabaa?**

1. Eyyee
2. Lakkii
3. Hin beeku

**11. Namni dhibee sukkaaraan qabamuu isaa beeke yeroo meeqa keessatti qorannoo ijaa godhuu qabaa?**

1. Battalamutti
2. Waggaa tokko keessatti
3. Waggaa lama keessatti
4. Waggaa shan keessatti
5. Kan biroo\_\_\_\_\_
6. Hin beeku

**12. Namni dhibee sukkaaraa qabu yeroo yeroon qorannoo ijaa isa barbaachisaa?**

1. Eeyyee,ni barbaachisa
2. Hin barbaachisu
3. Hin beeku

**13. Dhibee sukkaaraan rakkoo Ratinaa dhufu addaan baasuuf qorannoo ijaa akkamii godhamuu qaba.**

1. Qorannoo gulantaa /sadarkaa qaroo ijaa
2. Qorannoo barbaachisummaa Manatsirii ijaa/eye -glass/ ,
3. Meeshaan kutaa duuba ijaa qoratamuun
4. Maakiroskoppii ykn baatiriin kutaa fuldura ijaa qoratamuun
5. Kan biroo\_\_\_\_\_
6. Hin beeku

**14. Rakkoo Ratiinaa /kutaa duuba ijaa/ sababadhibeesukkaaraan dhufuu qabdu?**

1. Qaba
2. Hin qabu
3. Hin beeku

**15. Sababa dhibee sukkaaraan rakkoo Ratiinaa qabaachuu keessan akkamitti beektan/Essaa dhageessan/?**

1. Kutaa hordoffii dhibee sukkaaraa irraa
2. Hakiima ijaa irraa
3. Yeroo duula yaalii ijaa irraa
4. Fira, hiriya...dhibee sukkaaraa qaban irra
5. Sab-quunnamitii ummataa/Raadiyoo, Televizynii, Gaazeexaa...kkf) irraa
6. Kan biroo\_\_\_\_\_

**Dhibee sukkaaraan rakkoo Ratinaa/kutaa duuba ijaa/ dhufu ilaachisee gochaawwan raawwataman**

**16. Hakiimajaa akka ilaalu hakimootaanergamtaniituu?**

1. Eyyee
2. Hin ergamne

**17. Dhibee sukkaaraa akka qabdan erga beektanii booda hakiima ijaan ilaallamtanii beektu?**

1. Eyyee ,nan beeka
2. Hin beeku

*(Lakkoofsa “17” irratti deebiin keessan “hin beeku” yoo ta’e, gara lakkoofsa 20 tti dabraa)*

**18. Waggaa dabre keessa yeroo meeqa qorannoo ija taasistan?**

1. Hin ilaalamne
2. Yeroo tokko
3. Yeroo lama
4. Yero sadii fi isaan ol

**19. Qorannoo ijaa akkamiitu isinii godhame?**

1. Qorannoo sadarkaa qaroo ijaa,
2. Qorannoo barbaachisummaa Manatsirii ijaa/eye glass/
3. Qorannookutaa duubaijaa
4. Maakiroskoppii ykn baatiriin qorannookutaa fuldura ijaa
5. Kan biroo\_\_\_\_\_

**20. Lakkoofsa “17” deebiin keessan “hin beeku” yoo ta’e, maalif?**

1. Barbaachisaa natti hin fakkaanne
2. Akkan qoramuHakiminni natti hin himne/nan hin gorsine,
3. Rakkoo maallaqaa irraa
4. Dhaabbata fayyaa mijaa’aa waanhin arganneef
5. Kan biroo\_\_\_\_\_

**21. Kanaan dura yeroo ulfa turtan qorannoo ijaa taasistaniitu?**

1. Eyyee
2. Hin taasifinne
3. Hin yaadadhu
4. Ana hin ilaallatu/Dhiira/dhibee sukkaaraa hin qabu/

*( Gaaffii lakkoofsa “21”fdeebiin keessan “Ana hin ilaallatu” yoo ta’e, gara gaaaffii lakkoofsa “23” tti dabraa)*

**22. Gaaffii lakkoofsa “21”f deebiin keessan “hin taasifinne” yoo ta’e, maaliif**

1. Barbaachisaa natti hin fakkaanne
2. Akkan qoramuHakiminni natti hin himne/nan hin gorsine,
3. Rakkoo maallaqaa irraa
4. Dhaabbata fayyaa mijaa’aa waan hin arganneef
5. Kan biroo\_\_\_\_\_

**23. Baayyina sukkaaraa dhiiga keessaa yeroo yeroon niqoratamitu?**

1. Eeyyee
2. Hin qoratamu
3. Hin yaadadhu
4. Anaan hin ilaallatu

**24. Gaaffii lakkoofsa “23”f deebiin keessan “hin qoratamu” yoo ta’e, maaliif? (Haa ibsamu)**

1. Barbaachisaa natti hin fakkaanne
2. Akkan qoramuhakiiminni natti hin himne/nan hin gorsine,
3. Rakkoo maallaqaa irraa
4. Dhaabbata fayyaa mijaa’aa waan hin arganneef
5. Kan biroo \_\_\_\_\_

**25. Dhiibbaa Dhiigaa keessan yeroo yeroon niqorachiisitu?**

1. Eyyee
2. Hin qorachiisu
3. Hin yaadadhu
4. Anaan hin ilaallatu

Deebiin keessan eyyee yoo ta’e , yeroo hagamiin taasistu? \_\_\_\_\_

**26. Gaaffii lakkoofsa “25”f deebiin keessan “hin qorachiistu” yoo ta’e ,maaliif/yaa ibsamu/?**

1. Barbaachisaa natti hin fakkaanne
2. Akkan qoramuHakiiminni natti hin himne/nan hin gorsine,
3. Rakkoo maallaqaa irraa
4. Dhaabbata fayyaa mijaa’aa waan hin arganneef
5. Kan biroo \_\_\_\_\_

**27. Kanneen armaani gadii keessaa yeroo hunda kamiin hojiirra oolchitu?/Deebii tokkoo ol kennuun ni danda’ama/**

1. Sigaaraa nan xuuxa,
2. Sochii jabiinsa qaamaa nan hojjedha,
3. Dhibee sukkaaraaf nyaata barbaachisaa ta’e nan hordofa,
4. Hordoffii dhibee sukkaara kootiif barbaachisaa nan raawwadha,

## **Ilaalcha Rakkoo Raatinaa( Kutaa Duuba Ijaa) DhibeeSukkaaraan Dhufu Ilaala**

**(Tokkoon tokkoo himaa barreeffame jalatti filannoowwan kaawwaman bu'ureeffachuun yaada/ilaalcha keessanii kaa'aa )**

**28. Dukkubsattota dhibee sukkaaraaf Qorannoon ijaa ni barbaachisa.**

1. Baayyee walii hingalu
2. Hanga tokko walii hingalu
3. Yaada tokkollee hin qabu
4. Hanga tokko waliingala
5. Baayyee waliingala.

**29. Dhukkubstaan dhibeesukkaaraa kamiyyuu sadarkaan qaroo ijaa isaa hir'atu baatulle,qorannoo ijaa isa barbaachisa.**

1. Baayyee walii hingalu
2. Hanga tokko walii hingalu
3. Yaada tokkollee hinqabu
4. Hanga tokko waliin gala
5. Baayyee waliin gala.

**30. Namni haaraadhibee sukkaaraan qabameqorannoo ijaa isa ni barbaachisa.**

1. Baayyee walii hin galu
2. Hanga tokko walii hin galu
3. Yaada tokkollee hin qabu
4. Hanga tokko waliin Gala
5. Baayyee waliin gala

**31. Baayyina sukkaara dhiigaa sirriitti to'achuun rakkoo Ratinaa Dhibee Sukkaaraan dhufu ni ittisa.**

1. Baayyee walii hin galu
2. Hanga tokko walii hin galu
3. Yaada tokkollee hin qabu
4. Hanga tokko waliin nan gala
5. Baayyee waliin nan gala.

**32. Dhiibbaa dhiigaa sirriitti to'achuun rakkoo Ratinaa Dhibee Sukkaaraan dhufu ni ittisa.**

1. Baayyee walii hin galu
2. Hanga tokko walii hin galu
3. Yaada tokkollee hin qabu
4. Hanga tokko waliin nan gala
5. Baayyee waliin nan gala.

**33. Dubartiin dhibee sukkaaraa qabdu kamiyyuu yeroo ulfaa qorannoo ijaa godhachuu qabdi.**

1. Baayyee walii hin galu
2. Hanga tokko walii hin galu
3. Yaada tokkollee hin qabu
4. Hanga tokko waliin nan gala
5. Baayyee waliin nan gala.

**34. Yaalli leezarii ijaa rakkoo Retinaa dhibee sukkaaraan dhufu ni ittisa.**

1. Baayyee walii hin galu
2. Hanga tokko walii hin galu
3. Yaada tokkollee hin qabu
4. Hanga tokko waliin nan gala
5. Baayyee waliin nan gala.

**Ibsa**

Ani\_\_\_\_\_ibsawwan armaan olitti barreeffaman dubbisuun hubadhee fedhii kootiin qorannoo kana irratti hirmaachuuf waliigaleera.

Mallattoo\_\_\_\_\_

## Appendix VI – Letter of Ethical Approval



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14<sup>th</sup> December 2016

Dr. Aida Sraj  
Reg. No. H58/75354/2014  
Department of Ophthalmology  
School of Medicine  
College of Health Sciences  
University of Nairobi

Dear Dr. Sraj,

**REVISED RESEARCH PROPOSAL- KNOWLEDGE, ATTITUDES AND PRACTICES ON DIABETIC RETINOPATHY AMONG PATIENTS ATTENDING THE DIABETES CLINIC AT JIMMA SPECIALIZED UNIVERSITY HOSPITAL, SOUTH WESTERN ETHIOPIA (P638/09/2016)**

This is to inform you that the KNH- UoN Ethics & Research Committee (KNH- UoN ERC) has reviewed and **approved** your above revised proposal. The approval period is from 14<sup>th</sup> December 2016 - 13<sup>th</sup> December 2017.

This approval is subject to compliance with the following requirements:

- a) Only approved documents (informed consents, study instruments, advertising materials etc) will be used.
- b) All changes (amendments, deviations, violations etc) are submitted for review and approval by KNH-UoN ERC before implementation.
- c) Death and life threatening problems and serious adverse events (SAEs) or unexpected adverse events whether related or unrelated to the study must be reported to the KNH-UoN ERC within 72 hours of notification.
- d) Any changes, anticipated or otherwise that may increase the risks or affect safety or welfare of study participants and others or affect the integrity of the research must be reported to KNH- UoN ERC within 72 hours.
- e) Submission of a request for renewal of approval at least 60 days prior to expiry of the approval period. (*Attach a comprehensive progress report to support the renewal*).
- f) Clearance for export of biological specimens must be obtained from KNH- UoN ERC for each batch of shipment.

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- g) Submission of an *executive summary* report within 90 days upon completion of the study. This information will form part of the data base that will be consulted in future when processing related research studies so as to minimize chances of study duplication and/ or plagiarism.

For more details consult the KNH- UoN ERC website <http://www.erc.uonbi.ac.ke>

Yours sincerely,



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