

**FACTORS CONTRIBUTING TO POOR TREATMENT OUTCOME OF VERNAL
KERATOCONJUNCTIVITIS IN CHILDREN IN THE LEPELLE-NKUMPI
MUNICIPALITY, LIMPOPO PROVINCE, SOUTH AFRICA.**

by

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DECLARATION

I declare that this mini-dissertation submitted to the University of Limpopo, for the degree of Master of Public Health, **Factors contributing to poor treatment outcome of vernal keratoconjunctivitis in children in the Lepelle-Nkumpi municipality, Limpopo Province, South Africa**, has not been previously submitted by me for a degree at this University or any other, that this is my work in design and execution and that all the material contained herein has been duly acknowledged.

.....
Maifadi K. V

.....
Date

DEDICATION

This mini-dissertation is dedicated to my loving husband, Mr T.C Mangoale for his unwavering support throughout this journey and to my two lovely daughters Palesa and Thoriso Mangoale.

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I would like to give my sincere appreciation and gratitude to the following:

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ABSTRACT

Background: Vernal keratoconjunctivitis (VKC) is a bilateral, chronic form of allergic eye disease characterized by inflammation of the conjunctiva and usually presents in the first decade of life.

Aim: The aim of this study was to determine the factors contributing to poor treatment outcome of vernal keratoconjunctivitis in children in the Lepelle-Nkumpi municipality, Limpopo Province, South Africa.

Methods: A quantitative study was conducted by using a structured questionnaire administered by the researcher to collect data at the eye clinics in Lebowakgomo and Zebediela Hospitals. A descriptive cross-sectional design was used to conduct the study. A systemic random sampling method was used to select 240 children between the ages of two and twelve years who had been diagnosed with VKC. Data was analysed by using the SPSS software program.

Results: Data is presented by applying descriptive and inferential statistics. The majority of parents/guardians (80%) reported not knowing about VKC even though the condition was explained to them when their children were first diagnosed. The study shows no association between gender of the parents/guardians and knowledge of VKC ($p>0.005$) as indicated on Table 4.6. The study shows association between education of parents/guardians and knowledge of VKC ($p<0.005$) as shown by Table 4.7. The parents/principal guardians (74.2%) reported that even if they could not manage to accompany their children all the time due to work primarily, they asked their next relative to accompany their children on their behalf so that children don't miss their review appointments.

Conclusion: It was, therefore, recommended that when a child is diagnosed with VKC, the parent/guardian should be given the details about the condition along with an information pamphlet/leaflet that contains important key factors about the condition for future reference. It is also recommended that after a child has taken treatment from the hospital for three consecutive months, a prescription letter should be given to the parent/guardian to collect treatment at the nearest clinic for the next three months to ensure compliance and easy access to medication.

Key words: Knowledge, Vernal keratoconjunctivitis, children, parents/guardians.

DEFINITIONS OF CONCEPTS

Bilateral: Involving both of two parts or sides of the body (Oxford Advanced Learner's Dictionary, 2005). In this study, bilateral refers to the nature of VKC, it affects two eyes.

Chronic: Lasting for a long time; difficult to cure (Oxford Advanced Learner's Dictionary, 2005). This means VKC is a long-term eye condition.

Keratoconus: Is a progressive disorder in which the cornea assumes a conical shape secondary to stromal thinning and protrusion (Kanski, 2007). In this study Keratoconus refers to the bulging forward of the cornea as a result of constant itching of the eyes.

Vernal keratoconjunctivitis: Is a bilateral, recurrent disorder of a chronic nature in which cell mediated mechanisms play important roles (Kanski, 2007). This means the activation of specific cells in response to an antigen plays an important role in controlling the condition.

ABBREVIATIONS

AKC : Atopic Keratoconjunctivitis

CEO : Chief Executive Officer

GPC : Giant Papillary Conjunctivitis

MRC : Medical Research Council

SAC : Seasonal Allergic Conjunctivitis

SPSS : Statistical Package for Social Sciences

VKC : Vernal Keratoconjunctivitis

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CHAPTER 1: OVERVIEW OF THE RESEARCH STUDY

1.1 Introduction and background

Vernal keratoconjunctivitis (VKC) has been described as a condition that is common in children who reside in hot climate areas. It is a non-infectious condition (not contagious) (Cronau, Kankanala & Mauger, 2010). VKC is a bilateral, recurrent disorder and usually presents in the first decade of life (Kanski, 2007) and it is a chronic inflammation of the conjunctiva (Hall & Shilio, 2010). The disease affects children between three to sixteen years of age though it may appear earlier than three years and continue into adulthood. In the majority of cases, the condition can resolve at puberty. In their article - La Rosa, Lionetti, Reibaldi, Russo, Longo, Leonardi, Tomarchio and Avitabile (2013) - indicated that VKC has three clinical forms: palpebral, limbal, and mixed, and occurs mostly in males. The potentially blinding complications of the condition can be greatly reduced by recognising the features of the disease, ensuring that these patients get adequate continuous treatment, through good patient education and regular, long-term follow-up (Hall & Shilio, 2010).

It has been realised that there are many children with recurring, progressive and persisting VKC which leads to a more aggressive form of conjunctivitis (Atopic keratoconjunctivitis) as well as other adverse eye conditions such as keratoconus and corneal opacities (Kanski, 2007). Corneal changes associated with VKC ranges from mild to severe (Kraus, 2016).

VKC can be successfully treated among children thus avoiding the development of adverse conditions that could otherwise have been prevented. Chronic VKC gives the child's eyes a dark brown appearance. Symptoms of VKC can include intense itching, irritation, photophobia and burning sensation. The itching is worse with exposure to wind, dust, bright light and hot weather. Some patients complain of a sticky, stringy mucous discharge. For cases where there is corneal involvement there are complaints of reduced vision (Foster & Baba, 2010).

Once the severity of the disease has been determined and characterised, a treatment plan is devised in order to provide adequate continuous treatment. Children with the condition are also given advice on frequent face washing and cold

compresses. Counselling stresses the chronic nature of the disease and parents are advised that eye drops take time to work and need to be continued even when the child feels better because the condition can recur more aggressively (Hall & Shilio, 2010).

VKC has been classified as an important public health problem (Kanski, 2007). It is indicated that eye diseases with the potential of affecting the cornea are a major cause of blindness (Whitcher, Srinivasan & Upadhyay, 2001) especially in developing countries like South Africa. This study has proven to be of significant relevance because VKC has the potential to lead to sight threatening conditions in children. Children experience the world through sight and any eye conditions that threaten their vision need to be addressed to prevent visual impairment and blindness.

As stated earlier, treatment of VKC can be successful, however in children from the Lepelle-Nkumpi Municipality there are factors that hinder the successful management of the condition. These factors were explored in more detail by the researcher and the research assistants. The study focussed on children between the ages of two to twelve years who have been diagnosed with VKC.

1.2 Research problem

It has been observed that a number of children present with VKC in Eye Clinics located in Lebowakgomo and Zebediela Hospitals. Also, it has been noted that most of these children had been suffering from this condition for a longer period, thus exposing them to other more aggressive ocular complications.

Unfortunately, VKC can potentially cause visual impairment and blindness thus causing an unwarranted disability on affected children. Consequently, children may struggle to adjust to mainstream schooling. In severe cases, some children get motivations to be removed from mainstream schools and be placed in schools for the visually impaired and the blind.

It was found that some factors which contributed to mismanagement of VKC included parents' poor/lack of knowledge on VKC and not following instructions on the application of the prescribed treatment. It was also noted that although the

majority of children have access to treatment of VKC, many lack people to accompany them to the health care facilities.

1.3 Purpose of the study

1.3.1 Aim of the study

The aim of this study was to establish the factors that contribute to poor treatment outcome of vernal keratoconjunctivitis in children in the Lepelle-Nkumpi Municipality, Limpopo Province, South Africa.

1.3.2 Objectives of the study

- To determine the knowledge of parents and guardians on vernal keratoconjunctivitis.
- To determine if children with VKC have access to relevant and appropriate eye care treatment.
- To determine if children with VKC have other related diseases.

1.4 Research question

What are the factors contributing to poor treatment outcome of vernal keratoconjunctivitis in children in the Lepelle-Nkumpi Municipality, Limpopo Province, South Africa?

1.5 Methodology

This account of the methodology is only a summary of what is comprehensively discussed in Chapter 3.

1.5.1 Study site

The study was conducted at the Eye Clinics of Lebowakgomo and Zebediela Hospitals. These Hospitals are located in the Lepelle-Nkumpi Municipality, in the Capricorn District of Limpopo Province, South Africa and are the only Hospitals in the Municipality providing Eye care services.

1.5.2 Research design

A quantitative research approach that applied a cross-sectional design was used to conduct the study.

1.5.3 Population and sampling

A systemic random sampling method was used to select the study participants.

1.5.4 Data collection

Data collection means the gathering of data from participants by using different methods to capture and translate into information that can be analysed (Polit & Beck, 2008). A structured questionnaire was administered by the researcher.

1.5.5 Data analysis

Data was analysed with the assistance of the University statistician by using the Statistical Package for Social Sciences (SPSS) software program. Descriptive and inferential statistics were used to analyse data.

1.6 Ethical considerations

Ethical clearance to conduct the study was granted by the University of Limpopo's Research and Ethics Committee. Permission to collect data at Lebowakgomo and Zebediela Hospitals was granted by the Limpopo Department of Health and the Chief Executive Officers at the two Hospitals. Consent was obtained from the participants prior to data collection.

1.7 Conclusion

This chapter introduces the study, problem statement, the purpose and summarises the methodology of how the study was conducted. Chapter 2 reviews the literature that is relevant to this study.

CHAPTER 2: LITERATURE REVIEW

2.1 Introduction

A literature review is a critical summary of previous research studies done on the topic of interest in order to put the research problem into context (Polit & Beck, 2008). Review of literature in this chapter will look into the clinical presentation of VKC in children, access to relevant and proper eye treatment, climatic conditions and heredity as contributing factors as well as the ocular implications of VKC.

2.2 Clinical presentation of VKC in children

Children with VKC generally present with the condition in early to mid-childhood. The symptoms they present with consist predominantly of eye itching along with tearing, discharges, irritation, redness and photophobia. Clinically, VKC can be divided into 3 subtypes which are conjunctival, limbal and mixed presentations. Clinical signs of the conjunctival form of VKC could show thick, mucous discharge, cobblestone papillary reaction of the upper tarsal conjunctiva, papillary changes of the bulbar conjunctiva especially at the limbus. The limbal form may show limbal papillae (Kraus, 2016). The limbal form of VKC is well recognized and found more frequently in the black population (Kassahun & Bejiga, 2012).

Signs of VKC usually appear in the conjunctiva and cornea and include large papillae on the tarsal surface of the upper lid and bulbar conjunctiva and Horner-Trantas dots (yellow-white dots on the limbal conjunctiva) (Caceres, 2010). VKC affects young children, prompt and appropriate treatment is important not only to improve the quality of a child's life but to avoid the risk of corneal degeneration and visual impairment (Zicari, Nebbioso, Lollobrigida, Bardanzellu, Celani, Occasi, Cesoni Marcelli & Duse, 2013).

2.3 Access to relevant and proper eye care

The successful clinical management of VKC requires a swift diagnosis, correct therapy, and evaluation of the prognosis. The diagnosis is generally based on the signs and symptoms of the disease and treatment is tailored as such (Bonini, Coassini, Aronni & Lambiase, 2004).

Hall and Shilio (2005) indicated that parents and patients' counselling backed by patient information leaflets was critical in breaking the cycle of inadequate treatment of VKC. The authors further indicated that a child seen with VKC can be given treatment and seen again a month later apparently not any better. Alternative and more aggressive treatment can be used without the initial treatment and with no counselling done about the disease. Many times, children move from one Hospital to another picking up bottles of treatment when symptoms become unbearable. The child may still have symptoms even after many years of taking treatment.

VKC is an inflammatory disease and controlling the signs and symptoms may be a challenge due to the chronicity and severity of the disease. However, avoidance of triggers and life-style planning must be accompanied by pharmacological treatments which involve topical ocular and non-ocular pharmacological treatment. This constitutes the effective treatment of VKC. Non-ocular pharmacological treatment involves the patients and parents being instructed regarding the nature and duration of the disease and possible complications. Psychological support may be necessary in severe cases of the disease (Leonardi, 2013).

The first line of VKC treatment, if such is possible, is the identification of allergens such as pollen and protection from the environmental factors such as the sun and wind that may exacerbate the disease. Protection with the use of sunglasses, spectacles with tint or sunsensor, hats with visors can be recommended to the patient. Frequent hand and face washing can also be helpful. Cold compress may serve as a natural decongestant. Ocular pharmacological treatment is started on presentation and continued all year, depending on the allergen exposure if known and duration of the symptoms. Topical drugs for VKC belong to several pharmacologic classes and those are vasoconstrictors, antihistamines, mast cell stabilizers and anti-inflammatory agents (Leonardi, 2013).

VKC treatment is symptomatic and tailored to the severity of the disease (Hall & Shilio, 2010). Treatment is considered ineffective when the patient does not respond to conventional VKC treatment. If symptoms worsen, treatment may be altered to a more aggressive regime that includes steroids. Possible reasons for conventional VKC treatment to be ineffective could be incorrect use of topical treatment, waiting for eye drops to run out before attending a review/follow up and total discontinued treatment/defaulting on treatment.

There are cases of limbal VKC which can be unresponsive to anti-allergic treatment alone. A proven case of a 5-year old boy who was previously unsuccessful with conventional anti-allergic therapy alone presented with clinical features of limbal VKC. The toddler was successfully managed with a combination of anti-allergic and anti-inflammatory therapy. This case indicates the importance of prescribing the most appropriate pharmaceutical medication for VKC since conjunctival and limbal lesions are often resistant to anti-allergy therapy alone (DeGaulle & Shanthi, 2011). There is a great need to a disease severity grading in order to develop standardized therapeutic guidelines based on the stage of VKC (Saleh & Mahfouth, 2011).

In general, in the management of ocular allergic diseases such as VKC, the primary role is to recommend non-pharmacologic and pharmacologic therapeutic regimens that address the acute presentation of ocular allergy and provide prophylaxis aimed at providing long-term maintenance therapy. This approach to the management of allergic eye diseases aims to minimize the impact of the allergic reaction on a child's quality of life. Lastly, to achieve success in the management of allergic eye diseases, considerable understanding of the pathophysiology, clinical features, differential diagnosis of the different types of ocular surface allergic diseases as well as adequate knowledge of their pharmacotherapy (DeGaulle, 2009).

2.4 Systemic diseases and heredity

VKC remains an allergic eye disease (Bonini, Coassini, Aronni & Lambiase, 2004). Patients with VKC frequently have a family or medical history of atopic diseases, such as asthma, rhinitis, and eczema (Saleh & Mahfouth, 2011). However, an article by Leonardi, Motterle and Bortolotti (2008) indicate that Atopic Keratoconjunctivitis is often associated with atopic dermatitis, and other allergic disorders such as rhinitis and asthma. Kassahun & Bejiga (2012) indicated in their

article that two-third of children with VKC have family history of atopy (allergic rhinitis, asthma, and eczema).

2.5 Climatic conditions

VKC is more prevalent in hot and dry areas. Humid seasons (summer and spring) exacerbate the symptoms of VKC, however patients have symptoms all year-round (Saleh & Mahfouth, 2011). VKC is a disease showing great racial and geographical variation as it is most common and most severe in hot, dry environments. Climate and geography also correlate with the associated concurrence of asthma and eczema (Kraus, 2016).

The catalyst for progression of mild VKC to moderate/severe VKC as well as the occurrence of exacerbations is still to be well defined, however, suggested causes of exacerbation are said to be from allergenic re-exposure and/or sunlight, wind, and dust (Duke, Odey & De Smedt, 2016). According to Duke, *et al.* (2016), a progressive increase in environmental temperature in a hot and dry climate may be one factor that encourages exacerbation of the disease especially in the limbal type of VKC.

2.6 Associated complications of VKC

Kraus (2016) indicated that other conditions may coexist in children with VKC. There are increased incidences of keratoconus (potentially due to eye rubbing). Severe VKC in developing countries is a potentially blinding disease. Visual loss may be as a result of corneal complications including corneal vascularization, corneal scars, severe astigmatism and keratoconus as well as complications arising from the unsupervised use of topically administered corticosteroids (Tabbara, 1999). Topical corticosteroids are usually given for a short period of time as they can lead to cataracts and glaucoma. Also, parents/guardians keep consulting more than one health care practitioner in search of treatment for their children and this leads to prolonged use of steroid drops, thus increasing the risk of complications (Saleh & Mahfouth, 2011).

VKC is an important public health problem especially in the hot and dry regions in Africa. Tremendous progress has been made in combatting measles, vitamin A deficiency, and ophthalmia neonatorum in developing countries, so that these

conditions are no longer regarded as leading causes of corneal blindness in Africa. Conditions such as VKC are becoming a more important cause of corneal visual impairment and blindness (Duke, *et al.*, 2016).

2.7 Conclusion

This chapter has reviewed literature that relates to VKC from most angles. Chapter 3 describes the methodology that outlines how the study was conducted.

CHAPTER 3: RESEARCH METHODOLOGY

3.1 Introduction

Research methodology is the manner in which the researcher plans to structure a study as well as collect and analyse data (Polit & Beck, 2008). This chapter discusses the research method, study area, population as well as methods used to collect and analyse data.

3.2 Research method and design

Quantitative research method was used to conduct this study. Quantitative research method is defined by Burns and Grove (2009) as a formal, objective and systematic process in which numerical data is used to obtain information. A descriptive cross-sectional design was used to conduct the study. A cross-sectional design involves the collection of data during a single time period (Polit & Beck, 2008). Data about the factors contributing to poor treatment outcome of children diagnosed with VKC was collected on only one occasion.

3.3 Study area

The study was conducted in the Eye Clinics of Lebowakgomo and Zebediela Hospitals. These Hospitals are located in the Lepelle-Nkumpi Municipality, in the Capricorn District of Limpopo Province, South Africa and are the only Hospitals in the Municipality providing Eye care services. The Lepelle-Nkumpi Municipality has a total population of 230 350 (South African Health Review, 2012/2013).

Eye care practitioners also render eye care services at the surrounding clinics, however treatment of VKC is administered at Lebowakgomo and Zebediela Hospitals to monitor compliance and progress. The people who consult at Lebowakgomo and Zebediela Hospitals are mostly from rural areas where unemployment and poverty rates are high.

3.4 Population

Population is defined as the entire group of persons or objects that the researcher is interested in studying (Brink, van der Walt & van Rensburg, 2013). The study population were children from the age of two to twelve years who have been

diagnosed with VKC and have been receiving treatment for at least six months as well as their parents and guardians. The total number of children with VKC who were available at the time the study was conducted was 240 for the Eye clinic at Lebowakgomo Hospital and 120 for Zebediela Hospital.

Interviews were conducted with the parents/guardians of these children and the ratio of parent/guardian to child was 1:1. This ratio eliminated issues such as the number of parents/guardians participating in the study being less than the number of children (i.e. one parent/guardian bringing more than one child). The total number of parents/guardians of children with VKC who were available at the time the study was conducted was 240 for the Eye clinic at Lebowakgomo Hospital and 120 for Zebediela Hospital.

3.5 Sampling

The sample size for children at Lebowakgomo Hospital was approximately 148 and the sample size for children at Zebediela Hospital was approximately 92. The sample size for parents/guardians at Lebowakgomo Hospital was approximately 148 and the sample size for parents/guardians at Zebediela Hospital was approximately 92. These sample sizes were derived from the population sizes as indicated by the list of sample sizes by Morgan & Krecjie (1994). Children with VKC are brought to the Eye Clinics on a daily basis for review/follow up by their parents, guardians, school teachers and health care providers from other disciplines.

The sampling method that was used to select the participants was systemic random sampling (probability sampling). A list of all children who came for their review eye examination was made daily during the data collection process. Each child was assigned a number. Sampling fraction was calculated (population size ÷ sample size) ($240 \div 148$) which was rounded up to 2. First child was selected at random based on the results from the sampling fraction (2). For example, a number was randomly selected between 1 and 2. Number 1 was randomly selected. Subsequent children were selected at equal intervals. For example, every second child was selected starting with child number 1, followed by 3, then 5, and so forth.

- **Inclusion criteria**

Participants included in the study were parents or guardians of children between the ages of two and twelve years who have been diagnosed with VKC and have been on treatment for a minimum of six months.

- **Exclusion criteria**

Participants excluded in the study were parents or guardians whose children fall outside the age range of two and twelve years even though they have been diagnosed with VKC and are on treatment. Children outside the age range of two and twelve years were not part of the population. Other exclusions were other forms of allergic eye disease such as seasonal allergic conjunctivitis (SAC), atopic keratoconjunctivitis (AKC) and giant papillary conjunctivitis (GPC). Children with external eye diseases like bacterial or viral conjunctivitis, major traumatic insults to the eye were also excluded.

3.6 Data collection

The researcher administered a structured questionnaire (Appendices A/B) to collect data. The participants were parents or guardians of children between the ages of two and twelve who have been diagnosed with VKC. The parents or guardians took part in the study on behalf of the children as they were not of legal age to give consent.

The researcher also focussed on the Hospital records (files) of these children to observe the VKC treatment given over the months and the general medical history of the child. A data collection sheet was used to assist the researcher capture this information. The questionnaire was in the language best understood by the participants in the Lepelle-Nkumpi Municipality area (Sepedi) as well as in English. Participants who could not read or write were assisted to answer the questionnaire by the researcher or the research assistants. The questionnaire consisted of closed ended questions where the participants selected from the answers provided.

The questionnaire was divided into the following sections:

- Section A: Demographic information of parent/guardian and child
- Section B: Eye care information of the child

- Section C: Knowledge of parent/guardian
- A data collection sheet which was used by the researcher followed the questionnaire.

3.7 Data analysis

Analysis of quantitative data requires statistics as a powerful tool available to the researcher (Brink et al, 2013). The questionnaires were initially manually numbered and grouped for each Hospital to ensure that no questionnaire was captured twice. Data was then captured on a Microsoft Excel spread sheet before analysis. Data was then analysed by using the Statistical Package for Social Sciences (SPSS) software program. Descriptive and inferential statistics were used to analyse data with the assistance of the statistician from the University of Limpopo.

3.8 Reliability

Reliability refers to the consistency with which a measuring instrument produces a certain result when the unit being measured has not changed (Leedy & Ormrod, 2001). Reliability is concerned with the consistency of the measuring instrument. An instrument is said to be reliable when the same instrument can be used to measure the same individuals at different times with the same results (Burns & Grove, 2009). A pilot study with ten participants was conducted to test the instrument for reliability. The structured questionnaire was tested for factors such as language use and whether the format of the study was consistent with the objectives of the study. The pilot study was conducted at Jane Furse Hospital (Eye Clinic) on randomly selected children between the ages of two and twelve with a positive diagnosis of VKC and who have been on treatment for a minimum of six months.

3.9 Validity

Validity refers to the degree to which the instrument measures what it is intended to measure (Burns & Grove, 2009). A pilot study with ten participants was conducted to test the instrument for validity.

3.10 Bias

Bias is a deviation from the truth that produces error or distortion which can affect the quality of the research data (Brink et al, 2013). Only children between the ages of

two and twelve years who have already been diagnosed with VKC and have been on treatment for a minimum of six months participated in the study.

The same structured questionnaire was used for all the participants to ensure consistency. During data collection, sufficient information was given to the research assistants (Optometrists) prior to the study in order to acquire correct results. Conclusions were drawn solely from the responses on the questionnaire.

3.11 Ethical considerations

- Ethical clearance**

The researcher had requested ethical clearance from Turfloop Research Ethics Committee (TREC) which granted such clearance. There were neither any tests performed nor physical harm done to the children during the data collection process. Participants were informed of their right to withdraw from the study as participation was voluntary.

- Permission**

Permission to collect data from willing participants was requested from the Limpopo Department of Health and the Chief Executive Officers at Lebowakgomo and Zebediela Hospitals. Approval was granted by the Limpopo Department of Health and the Chief Executive Officers at Lebowakgomo and Zebediela Hospitals.

- Confidentiality**

Confidentiality is an act of not disclosing any information obtained from the participant deliberately or accidentally in ways that might identify the participant. In a research context it can be explained as not discussing information provided by an individual with others and presenting findings in ways that ensure that participants cannot be identified (Wiles, Crow, Heath & Charles, 2008).

A consulting room was used for the purpose of collecting data to ensure privacy and for the participants to participate freely. Participants' questionnaires were kept safe. All answered questionnaires were handled by the researcher to ensure confidentiality.

- **Informed consent**

The principle of informed consent is the central doctrine and the most important part of any research study. For it to be genuine and effective, it should be in a simple language that the participants understand. The information contained in the consent form must be true and should cover all the relevant aspect concerning the research study and no fact should be hidden, however important or unimportant it may be (Jharna & Subhash, 2014).

Written consent was obtained from parents and guardians (participants) on behalf of the children. The participants were also informed of their right to withdraw from the study at any time and their withdrawal will not be used against them in any way (Stommel & Wills, 2004). Participation was voluntary. The participants were briefed on the objectives and purpose of the study before they could give consent. Those who agreed to participate in the study signed a consent form.

- **Justice**

The researcher did not impose any form of persuasion and coercion on the participants. The participants have a right to withhold information and to question the researcher should they not understand the questions asked (Burns & Grove, 2009).

3.12 Significance of the study

This research study is of great importance as it involves the eye health of children. Sight is a phenomenal cardinal sense in the human body that allows children to explore and learn the world. It is therefore of utmost importance to preserve the sight of children by improving their eye health. This study highlights the significant factors involved in the management of VKC in children and indicates factors not adhered to in the management.

The researcher hopes to add to the body of knowledge on VKC as there is not a lot of literature available currently with regards to VKC. This makes this research study relevant and significant. Recommendations based on the results of the study will be made accessible to the Limpopo Department of Health with the hope of influencing improvement of VKC management in general.

3.13 Conclusion

This chapter discusses the research methodology according to which the study was conducted. These sections are covered in Chapter 3: Research approach, study site, research design, population, sampling, data collection, data analysis, reliability and validity, bias, ethical considerations, and the significance of the study.

CHAPTER 4: RESEARCH RESULTS

4.1 Introduction

In this chapter, the results of the study are displayed. Tables and figures are used to present the results. A structured questionnaire was answered by 240 parents and guardians in relation to VKC. The SPSS software program was used to analyse the results. The results are presented according to the sections of the questionnaire.

4.2 Presentation of results

4.2.1 Section A: Demographic information of parents/guardians and children

Demographic Profile of the children (n=240)

Ages of children

The study concluded a total of 240 children. Their ages ranged between 2 and 12 years with a mean of 5 years. The age distribution is as shown in Figure 4.1.

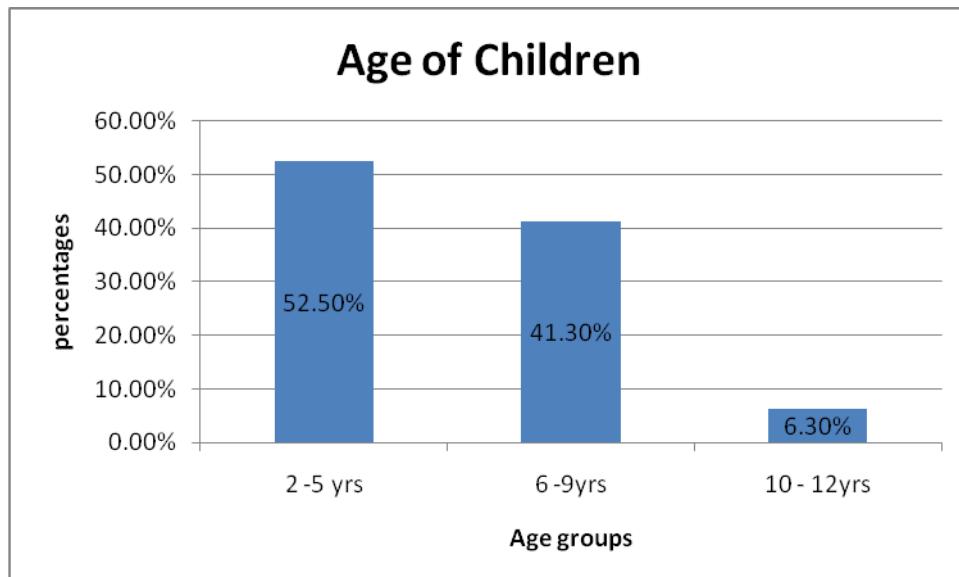


Figure 4.1: Showing the ages of children

Gender of children

Among the 240 children in the study, 115 (47.9%) were male and 125 (52.1%) were female.

Demographic Profile of the guardians (n=240)

Ages of parents/guardians

From the study, it was found that out of 240 parents/guardians who accompanied their children, 113 (47.1%) were less than 40 years of age and, 127 (52.9%) were over 40 years of age. A total number of 74.2% of guardians were accompanying children on behalf of their parents or principal guardians. Most parents (39.2%) less than 40 years of age are employed and often ask other family members to accompany the children to the Hospital.

Gender of parents/guardians

Among the 240 parents/guardians who accompanied their children, 11 (4.6%) were male and 229 (95.4%) were female.

Level of education of parents/guardians

In this study, the majority of parents/guardians, 133 (55.4%), had acquired a secondary school education, 87 (36.3%) had a tertiary level education, 19 (7.9%) acquired a primary level education and only 1 (0.4%) had adult literacy education. The distribution is as indicated in Figure 4.2.

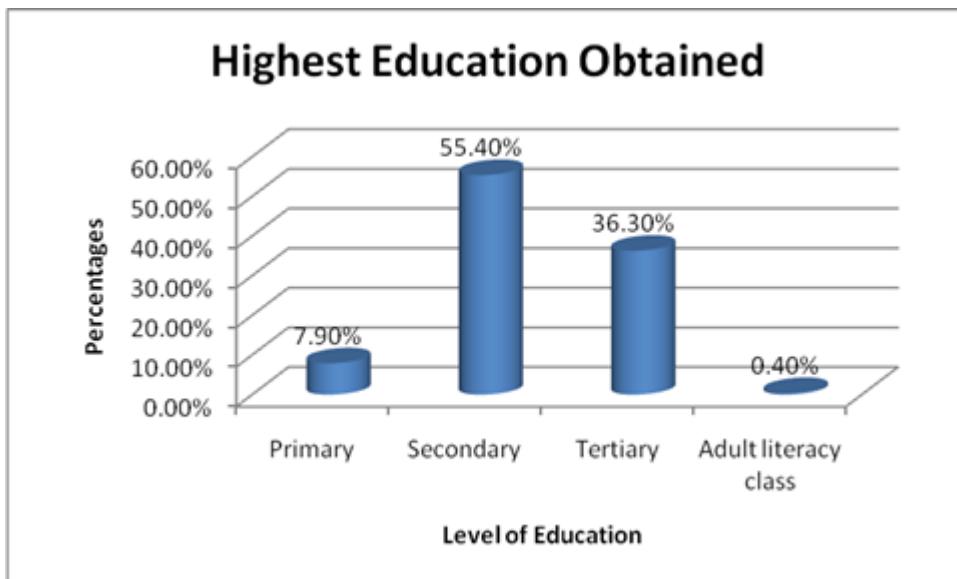


Figure 4.2: Showing the level of education of parents/guardians

Occupation of parents/guardians

Majority, 94 (39.2%), of the parents/guardians were employed,. The state of employment of the reat of the parents/guardians is as shown in Figure 4.3.

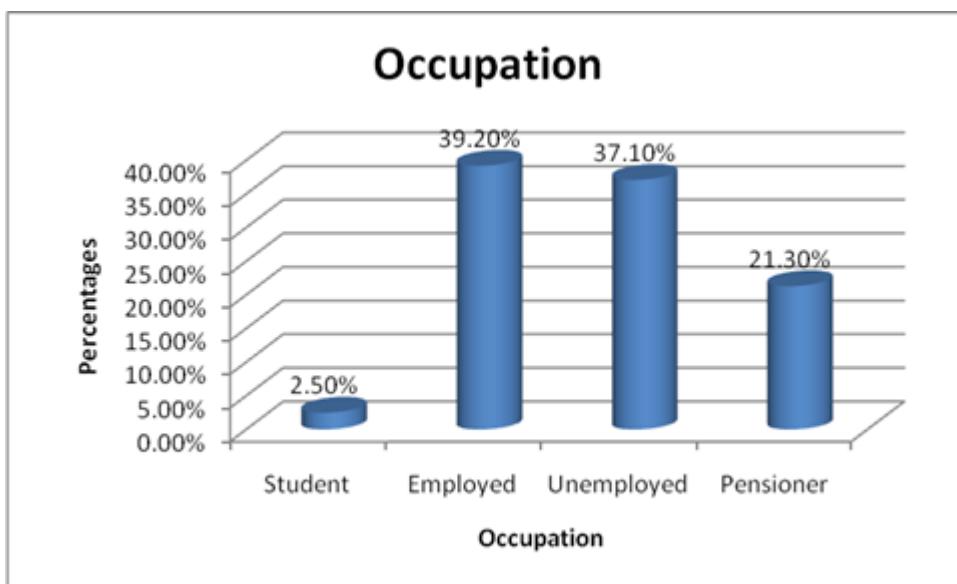


Figure 4.3: Showing the state of employment of parents/guardians

Source of household income

Majority of the parents/guardians, 95 (39.6%), had a monthly salary, while 52 (21.7%) received social grant for children, 47 (19.6%) received old age grant/pension grant and 46 (19.2%) were receiving an income from unstable employment. The distribution is as shown in Figure 4.3.

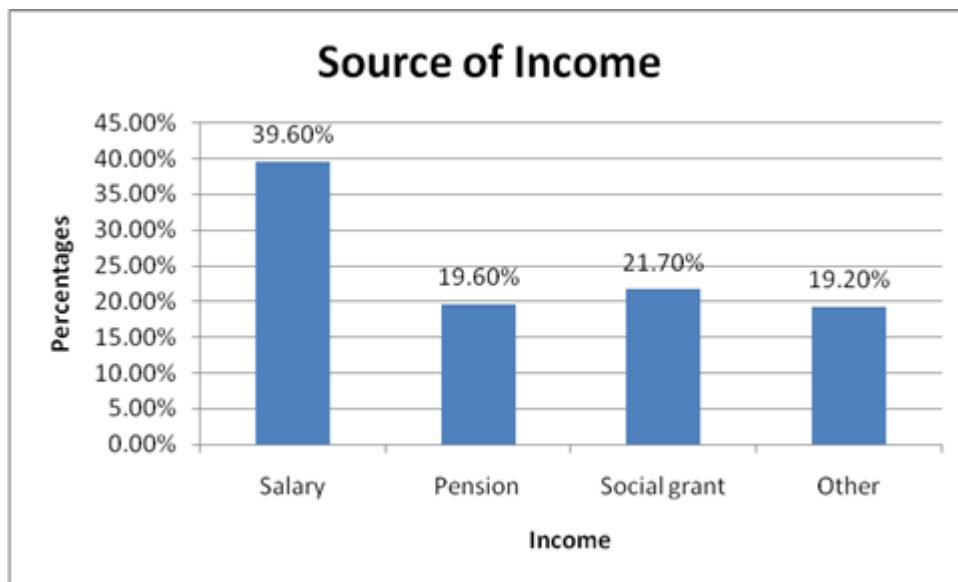


Figure 4.4: Showing the source of household income

Place of residence

The study indicated that the majority of the participants, 204 (85%), resided in villages with only 36 (15%) staying in the townships.

Tar road near residence

Hundred and forty (58.3%) reported living near a tarred road. Others, 100 (41.7%), reported not residing near a tarred road.

Table 4.1: Travel to nearest hospital

The majority of participants, 154 (64.2%), reported travelling by bus to the nearest Hospital while 86 (35.8%) reported travelling by taxi. The transport expenses to the nearest Hospital are as indicated in Table 4.1.

Variable		Frequency	Percentage (%)
Travel to Hospital	Bus	154	64.2
	Taxi	86	35.8
Transport fee to nearest Hospital	R10-R20	3	1.3
	R20-R30	51	21.3
	R30-R40	155	64.6
	R50 or more	31	12.9

4.2.2 Section B: Eye care information of children

Table 4.2: Showing eye care information of children with VKC

In the current study, majority of children, 196 (81.7%), managed to attend all their eye care appointments. The study also indicated that 146 (60.8%) of parents/guardians reported the treatment regimen provided to the children to be the same monthly. The rest of the eye care information is as shown in Table 4.2.

Variable	Frequency	Percentage (%)
Does the child attend all eye clinic appointments?	Yes, all of them	196
	Some of them	44
Do you accompany the child to all eye clinic appointments or do you sometimes ask someone else?	I take the child	60
	I frequently ask someone	178
	No one to accompany child	2

Is the child given the same eye treatment regimen or is it different each month?	Treatment the same	146	60.8
	Treatment different each month	20	8.3
	Treatment different from time to time	74	30.8
Are you the one who administers eye treatment to the child?	Yes	140	58.3
	No, it's done by another person	100	41.7
How many times a day does the child take eye treatment?	Twice a day	198	82.5
	Three times a day	42	17.5

4.2.3 Section C: Knowledge of parents/guardians

Table 4.3: Knowledge of relevant information on VKC by parents/guardians

The study concluded that the majority, 192 (80%), of parents /guardians reported not having adequate knowledge of VKC. Among 240 parents/guardians, 238 (99.2%), reported not to have been given an information leaflet with relevant information on VKC for reference at home. The rest of the information on VKC provided by parents/guardians is as shown in Table 4.3.

Statement	Yes n (%)	No n (%)	Don't Know/Not sure n (%)
Should the bottle of eye drops be discarded after 30 days of opening the bottle?	157 (65.4%)	1 (0.4%)	82 (34.2%)
When instilling eye drops, must the tip of the bottle touch the child's eyes,	3 (1.3%)	63 (26.3%)	174 (72.5%)

hands or any surface?			
If the child stops using eye treatment, will the condition become worse than before?	168 (70.0%)	1 (0.4%)	71 (29.6%)
Do all your children have VKC during their childhood)?	1 (0.4%)	186 (77.5%)	53 (22.1%)
Do you know what VKC is?	48 (20.0%)	192 (80.0%)	
When your child was diagnosed with VKC, was the condition explained to you?	173 (72.1%)	17 (7.1%)	50 (20.8%)
Were you given an information pamphlet/leaflet about the condition to read at home?	1 (0.4%)	238 (99.2%)	1 (0.4%)

4.2.4 *Section D: Eye care history*

Table 4.4: Eye care history of children

In the study, 196 (81.7%), of cases were mild forms of VKC. Majority of children, 233 (97.1%), who had been diagnosed with VKC had no underlying systemic diseases. Information on the rest of the eye care history of children based on a period of six months is as shown in Table 4.4.

Variable		Frequency	Percentage (%)
Present condition of eyes	VKC mild	196	81.7
	VKC moderate	42	17.5
	VKC severe	2	0.8

Onset of eye problem (year)	2010-2011	12	5.0
	2012-2013	28	11.7
	2014-2015	200	83.3
Onset of eye treatment (year)	2010-2011	6	2.5
	2012-2013	21	8.8
	2014-2015	213	88.8
Medication over a period of 6 months	Same medication	189	78.8
	Medication different from time to time	50	20.8
Other diseases	None	233	97.1
	Eczema	4	1.7
	Asthma	3	1.3

4.3 The association between variables

In this section, the association between socio-demographic profile, knowledge, gender and education in relation to VKC is presented. The purpose was to determine whether association between variables did exist.

Table 4.5: Association between condition (VKC) and socio-demographic profile (SDP)

The study found a positive association between the ages of children and the development of VKC. An association also exists between the gender of children and the development of VKC as shown in Table 4.5.

SDP		Total	VKC (mild)	VKC (moderate)	VKC (severe)	P-value
Age	2-5yrs	126	114 (90.4%)	12 (9.5%)	0 (0%)	$\chi^2 = 15.018^a$ P= 0.005
	6-9yrs	99	71 (71.7%)	26 (26.2%)	2 (2.0%)	
	10-12yrs	15	11 (73.3%)	4 (26.6%)	0 (0%)	
Gender	Male	115	83 (72.1%)	31 (26.9%)	1 (0.8%)	$\chi^2 = 13.723^a$ P= 0.001
	Female	125	113 (90.4%)	11 (8.8%)	1 (0.8%)	

p=0.005 (age) p=0.001 (gender)

Table 4.6: Association between gender and knowledge of VKC

The study did not find any association between the gender of parents/guardians and their knowledge on VKC as indicated in Table 4.6.

Statement		Male	Female	P-value
Should the bottle of eye drops be discarded after 30 days (month) of opening?	Yes	5	152	$\chi^2 = 2.152^a$ P= 0.341
	No	0	1	
	Don't know/Not sure	6	76	
When your child was diagnosed with VKC, was the condition explained to you?	Yes	8	165	$\chi^2 = 1.047^a$ P= 0.593
	No	0	17	
	Cannot remember	3	47	
Do you know what	Yes	2	46	$\chi^2 = 0.024^a$

vernal keratoconjunctivitis is?	No	9	183	P= 0.617
If the child stops using eye treatment, will the condition become worse than before?	Yes	6	162	$\chi^2= 1.423^a$ P= 0.491
	No	0	1	
	Don't know/Not sure	5	66	
When instilling eye drops, must the tip of the bottle touch the child's eyes, hands or any surface?	Yes	1	2	$\chi^2= 6.632^a$ P= 0.036
	No	4	59	
	Don't know/Not sure	6	168	
Were you given an information pamphlet/leaflet about the condition to read at home?	Yes	0	1	$\chi^2= 0.097^a$ P= 0.953
	No	11	227	
	Cannot remember	0	1	

p>0.005 (gender versus knowledge of VKC)

Table 4.7: Association between education and knowledge of VKC

The study found an association between education of parents/guardians and their knowledge of VKC, as indicated in Table 4.7.

Statement		Primary	Secondary	Tertiary	Adult literacy class	P-value
Should the bottle of eye drops be	Yes	3	83	70	1	$\chi^2= 33.352^a$
	No	0	0	1	0	

discarded after 30 days (month) of opening?	Don't know/Not sure	16	50	16	0	P= 0.000
When your child was diagnosed with VKC, was the condition explained to you?	Yes	8	81	83	1	$\chi^2=$ 44.701 ^a P= 0.000
	No	1	13	3	0	
	Cannot remember	10	39	1	0	
Do you know what vernal keratoconjunctivitis is?	Yes	1	28	18	1	$\chi^2=$ 6.697 ^a P= 0.082
	No	18	105	69	0	
If the child stops using eye treatment, will the condition become worse than before?	Yes	6	94	67	1	$\chi^2=$ 18.264 ^a P= 0.006
	No	0	0	1	0	
	Don't know/Not sure	13	39	19	0	
When instilling eye drops, must the tip of the bottle touch the child's eyes, hands or any surface?	Yes	0	2	1	0	$\chi^2=$ 3.500 ^a P= 0.744
	No	2	37	24	0	
	Don't know/Not sure	17	94	62	1	
Were you given an information pamphlet/leaflet about the condition to read at home?	Yes	1	1	0	0	$\chi^2=$ 12.480 ^a P= 0.052
	No	18	132	87	1	
	Cannot remember	1	0	0	0	

p<0.005 (education versus knowledge of VKC)

4.4 Conclusion

The results are presented in the format of tables and figures in this chapter. In the next chapter, the major findings and recommendations are discussed. The recommendations are proposed based on the findings of this study.

CHAPTER 5: DISCUSSION OF MAJOR FINDINGS, LIMITATIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter discusses major findings and their implications as presented in Chapter 4. The recommendations are also discussed based on the findings of this study. The findings are discussed according to the sections in the questionnaire. The associations between variables are also discussed.

5.2 Discussion of major findings

• Age of children

VKC presents itself in the first decade of life as shown in Figure 4.1. Most of the children, 126 (52.50%) between the 2-5-year age group had mild VKC whereas severity was increasing more with age. Children, 99 (41.30%), in the 6-9 year age group had moderate to severe cases and the same was observed with children, 15 (6.30%) in the 10-12 year age group. This could be due to children, in the 6-12 year age group, consulting at the hospital when the VKC is in its moderate to severe state.

Most children with moderate to severe cases of VKC had the condition from a younger age but discontinued treatment due to a variety of reasons which range from relocating to new places to financial difficulties at home or the parents/guardians thinking the children have completely healed. This may have contributed to recurrence of the condition even more aggressively. According to Saleh and Mahfouth (2011), parents/guardians keep taking their children to more than one health care practitioner/health care facility looking for cure from the disease and this leads to the prolonged unsupervised use of steroid drops and increased risk of complications.

The study found an association between the ages of the children and the development of VKC (Table 4.5). A study conducted by Saleh & Mahfouth (2011) in Yemen found that VKC occurs between the ages of 2 and 10 years.

- **Gender of children**

VKC is a condition that was known to affect male children more and it was found that the gender differences were less absolute in hot climates (Kraus, 2016). This means VKC can affect males and females alike.

The study found an association between the gender of the children and the development of VKC (Table 4.6).

- **Age of parents/guardians**

Most of the guardians/grandparents (74.2%) take care of their grandchildren when their parents are at work with some children being in the permanent care of their relatives as their parents are deceased. With that being said, the age was not a contributing factor in this current study, as majority of children (81%) attended their eye clinic appointments with the majority (74.2%) being brought by guardians.

- **Gender of parents/guardians**

Most of the parents/guardians (95.4%) who accompanied their children for eye care were females and only 4.6 % were males. This is testament to the nurturing ability of women as most of these children are left in their care. Most of the children with VKC (52.9%) were accompanied to the hospitals by their grandmothers, aunts. Most of the men (4.6%) who brought the children to the hospital were bringing them for the first time as there was no one else in the family to do so.

However, the study did not find any association between the gender of the parents/guardians and how much they knew about VKC (Table 4.6).

- **Education**

The majority of the participants (55.4%) in this study had acquired a secondary education as shown in Figure 4.2. This means that a considerable number of people are likely to know how to take care of a child with VKC in terms of treatment. Table 4.3 indicated that, 65.4%), of parents/guardians was aware that an eye drop bottle is effective for a month due to preservatives and potency. The majority of the participants (70%) were fully aware that interruptions or discontinuing eye treatment could be a major setback in the management of the condition. Furthermore, there is

an association between education of parents/guardians and their knowledge of VKC, as indicated in Table 4.7.

- **Occupation**

The number of parents/guardians who were employed was nearly equal to the number of those that reported unemployment. Out of the 37.1% that was unemployed, 21.7% relied on their monthly social grant for their children and 19.6% were taking care of their households with the old age grant. Due to difficult and strenuous financial backgrounds, 64.2% of the parents/guardians travel to their nearest hospitals using buses. Although buses are affordable, the 12.9% staying in remote rural areas that are even farther away from the health care facilities find themselves paying R50 or more to travel to the nearest health care facility to collect medication for treatment.

- **Knowledge of the parent/guardian on VKC**

The majority of parents/guardians (80%) did not know what VKC was even though 72.1% of them reported that the condition was explained to them when their children were first diagnosed as indicated by Table 4.3. This could be due to the parents/guardians not having understood VKC when it was explained and the absence of information pamphlets/leaflets about the condition for parents/guardians to read at home. With VKC, individual counselling backed up by patient information leaflet is very critical in breaking the cycle of inadequate treatment and resulting frustration (Hall & Shilio, 2005)

It is important to note that most patients who consult in hospitals are afraid of health care practitioners. Their fear could be attributed to impatient health care staff that are frustrated by long patient queues, thus leading to shouting and humiliating patients. This kind of treatment intimidates patients in addition to their tiredness, hunger and not wanting to leave their seats for fear of losing a place in the queue (Pons, 2012). Therefore, it is possible that this makes them unwilling to ask further questions when a medical condition is explained to them even when they do not understand.

Malone and Bastian (2016) highlighted the fact that the aging process affects the ability to learn and remember new things and tasks. Therefore, the lack of information leaflets about VKC as a medical condition does not make the situation

any better. Even if VKC was explained in detail, most of the parents/guardians who accompany these children are grandparents and they forget easily. The information given about the condition will not be remembered unless information leaflets are provided to assist in terms of reference.

- **Eye care history of the children**

Most of the children (81.7%) managed to attend all eye clinic appointments and they were accompanied by a relative (Table 4.2). Most of the parents (74.2%) were employed and as such, they requested their next of kin to accompany their children to the hospitals on their behalf. The majority of parents/guardians (60.8%) reported that the eye treatment given on a monthly basis remains the same and when it differs, it's minimal.

In the current study, it was reported that the administration of treatment was done by the parents and in cases where the children were in the care of grandparents; the treatment would be given by a younger relative. Most of the children were given treatment only twice a day as opposed to the prescribed three times. This may be associated with the availability of children as they go to school in the morning and possibly return late in the afternoon. This arrangement also works to the benefit of the parents who helps the children with the eye treatment as they are at work for most of the day. This means that the children do not receive the adequate amount of treatment necessary to improve their condition and minimise symptoms. They receive insufficient doses daily for months and this contributes to the poor treatment outcome of the VKC. The children did have access to relevant and proper eye care treatment, however, the minimal/insufficient dosage at home could have an effect on the management of the condition.

Disease severity seems milder in limbal VKC leading to suspicions that it may be the early presentation of a spectrum of disease (Kraus, 2016). It is well recognized and found more frequently in the black population (Kassahun & Bejiga, 2012). Although the majority of children had mild VKC (81.7%), 18.3% faced debilitating and sight threatening complications which may sometimes manifest in adulthood and cause visual impairment and blindness. In addition, the quality of life of disease positive children is affected because they are limited in doing their preferred activities, in the attempt to avoid their eye condition getting worse (Duke *et al.*, 2016).

- **VKC and other related diseases**

In a study conducted in Ethiopia by Kassahun and Bejiga (2012) among primary school learners in Butajira Town, it was found that there was a low association between VKC and atopic diseases (allergic rhinitis, asthma, and eczema). There is often a history of allergy or atopic diseases such as allergic rhinitis, asthma or eczema , Saleh and Mahfouth (2011), but in this study, co-existing non-ocular allergic conditions could be detected in only 5 (12.2%) of the total 41 VKC cases (Kassahun & Bejiga, 2012). In the current study, 97.1% of children diagnosed with VKC had no atopic diseases.

5.3 Conclusion

The aim of this study was to determine the factors that contribute to poor treatment outcome of vernal keratoconjunctivitis in children. The following conclusions were drawn from the study:

- The majority of parents/guardians (80%) did not know what VKC was. This could be due to the parents/guardians not having understood VKC when it was explained to them and the absence of information pamphlets/leaflets about the condition for them to remind themselves at home. This poor knowledge could be a contributing factor to parents/guardians who go from one health care facility to another looking for cure from the disease (Hall & Shilio, 2005). These multiple consultations could have attributed to prolonged, unsupervised use of medications that led to complications such as keratoconus and corneal scars (Saleh & Mahfouth, 2011).
- Those that accompanied the children to the hospital for eye treatment were not necessarily the ones responsible for administering such treatment to the children. Treatment was given by either the parent of the children in the morning before going to work and at night when they returned or by relatives who had the ability to assist the children. This meant that the children did not receive the adequate amount of treatment necessary to improve their condition and minimise symptoms. They received insufficient doses daily for months and this contributes to the poor treatment outcome of the VKC. The children did have access to

relevant and proper eye care treatment, however, the minimal/insufficient dosage at home could have had an effect on the overall management of the condition.

- As shown in Table 4.4, in this study, most children with VKC had no underlying atopic diseases. Although VKC tends to be commonly associated with atopy (asthma, eczema) in temperate regions, many hospital-based studies from Europe, Asia, and Africa often found contradictory conclusions (De Smedt, Nkurikiye, Fonteyne, Hogewoning, Van Esbroeck, De Bacquer, Tuft, Gilbert, Delanghe & Kestelyn, 2011).

5.4 Limitations

There are a number of children whose hospital records indicated that they defaulted on treatment as a result of several reasons which included relocation and financial constraints. These children were often on and off treatment when such circumstances arose.

Age in this research study was a limitation. During the course of the study, it became apparent that VKC does affect toddlers younger than two years of age and in some young people/adolescents, it goes beyond 12 years.

5.5 Recommendations

Based on the results of this study, the following recommendations are made by the researcher:

- When a child is diagnosed with VKC, the parent/guardian should be given the details about the condition along with an information pamphlet/leaflet that contains important key factors about the condition for future reference. The leaflets should be in different languages that the people in the local area can understand.
- After a child has taken treatment for three consecutive months from the hospital, a prescription letter should be given to the parent/guardian to collect treatment at the nearest clinic for three months to ensure regular compliance. This will ensure that the child can access to eye treatment closer to home and travel costs will be

reduced. After collecting treatment for three months at the clinic, the child has to return to the hospital for review.

- In addition to providing treatment and education to the guardians, the Department of Health should consider giving caps/visors. VKC symptoms are exacerbated by exposure to the sun. Limpopo Province is very hot especially in spring and summer seasons. These caps/visors will protect the eyes from the harmful ultraviolet radiation from the sun, thus minimising symptoms of VKC and the development of other eye conditions such as cataracts and pterygium. Caps will last longer compared to sunglasses which the children can break easily during play.
- The eye care practitioners have to attend workshops regularly. This will make them aware of the recent and latest developments and information in the eye care field. They will be equipped with new and improved ways of treatment and care for various conditions that have been researched to provide better effects.

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APPENDIX A

Questionnaires

Dear Participant

Thank you very much for taking time to be part of this study. Your participation is highly appreciated. Please answer and complete all relevant questions by marking the appropriate box on the right with an (X) or by providing an answer in the space provided. Answer **Sections A, B and C**. Your participation is highly confidential and to ensure anonymity please do not write your name.

Section A: Demographic Information of parent/guardian and child

1. Age (child):

Age (parent/guardian):

2. Gender (child):

Male	1
Female	2

Gender (parent/guardian):

Male	1
Female	2

3. Highest education obtained:

Never attended school	1
Primary	2
Secondary	3

Tertiary	4
Adult literacy class	5

4. Occupation:

Student	1
Employed	2
Unemployed	3
Pensioner	4

5. Source of income:

Salary	1
Pension	2
Social grant	3
Other	4

6. Residential area:

Village	1
Township / peri-urban	2
Informal settlement	3

7. Is there a tar road near where you stay?

Yes	1
No	2

8. How do you travel to the Hospital?

Bus	1
Taxi	2
Walks to the Hospital	3

9. Transport fee to nearest Hospital:

Less than R10	1
R10 - R20	2
R20 - R30	3
R30 - R40	4
R50 or more	5

Section B: Eye Care information of the child

10. Does the child attend all Eye Clinic appointments?

Yes, all of them	1
Some of them	2
No, none at all	3

11. Do you accompany the child to all Eye Clinic appointments all the time or do you sometimes ask someone else?

I take the child all the time	1
I frequently ask someone else	2
Every month a different person accompanies the child	3
Sometimes there is no one to accompany the child to Hospital	4

12. According to your observation, is your child given the same eye treatment regimen or is it different each month?

Treatment the same	1
Treatment different each month	2
Treatment different from time to time	3
No treatment sometimes	4

13. Are you the one who administers eye treatment to the child?

Yes	1
No, it's done by another person at home	2
No one to help the child with eye treatment	3

14. How many times a day does your child take eye treatment?

Once a day	1
Twice a day	2
Three times a day	3

Section C: Knowledge of parent/guardian

15. Should the bottle of eye drops be discarded after 30 days (month) of opening the bottle?

Yes	1
No	2
I do not know/ I am not sure	3

16. When instilling eye drops, must the tip of the bottle touch the child's eyes, hands or any surface?

Yes	1
No	2
I do not know/ I am not sure	3

17. If the child stops using eye treatment, will the condition become worse than before?

Yes	1
No	2
I do not know/ I am not sure	3

18. Do all your children have VKC during their childhood?

Yes	1
No	2
It skips generations	3

19. Do you know what vernal keratoconjunctivitis (VKC) is?

Yes	1
No	2

20. When your child was diagnosed with VKC, was the condition explained to you?

Yes	1
No	2
Cannot remember	3

21. Were you given an information pamphlet/leaflet about the condition to read at home?

Yes	1
No	2
Cannot remember	3

22. If the answer on question 21 above is yes, in which language was the pamphlet/leaflet?

Sepedi	1
English	2

Other	3
-------	---

Thank you for your participation.

THE END

APPENDIX B

TLALELETŠO B

Letlakala la dipotšišo tša go ithuta

Thobela Morena/Mohumagadi

Ke leboga kudu ge le tšere nako ya lena go ba karolo ya porojeke ye ya dinyakišo.

Le kgopelwa go araba dipotšišo ka go dira (**X**) mo lepokising la maleba goba ka go ngwala karabo ya gago sekgobeng se filwego. Araba karolo ya **A**, **B** le **C**. O kgopelwa go se ngwale leina la gago godimo ga dipotšišo, e tla ba sephiri.

Karolo A: Tshedimošo ya ka qae ya motswadi/mohlokemedi le ngwana.

1. Mengwaga (ngwana):

Mengwaga (motswadi, mohlokemedi)

2. Bong (ngwana):

Monna	1
Mosadi	2

Bong (motswadi/mohlokemedi):

Monna	1
Mosadi	2

3. O fihlile kae ka dithuto?

Lefeela	1
Mphato wa bohlano	2
Marematlou (mphato wa 6-8)	3
Dithuto tša godimo	4
Dithuto tša bogolo	5

4. Mošomo wa gago ke eng?

Moithuti	1
Mošomi	2
A ke some	3
Motšofe	4

5. Letseno la gago kgwedi le kgwedi ke lefe?

Mogolo	1
Phentšhene	2
Mphiwafela wa mmušo	3
Tše dingwe	4

6. Bodulo:

Magaeng	1
Lekheišeneng	2

Mekhukhung	3
------------	---

7. Go na le tsela ya sekontiri kgauswi le mo le dulago?

Eng	1
Aowa	2

8. Le fihla ka eng sepetlele?

Bese	1
Tekisi	2
Ka maoto	3

9. Tefelo ya senamelwa sa go ya sepetlele sa kgauswi:

Ka fase ga R10	1
R10 - R20	2
R20 - R30	3
R30 - R40	4
R50 goba go fetiša	5

Karolo B: Tshedimošo ka ga hlokomelo ya mahlo a ngwana

10. Naa ngwana o kcona go fihla kliniking ya mahlo ge a filwe letšatšikwgwedi la go boy?

Eng, ka mehla	1
Ka dikgwedi tše dingwe	2

Aowa, ga a kgone go fihla	3
---------------------------	---

11. Naa motswadi/mohlokemedi wa ngwana o kgona go felegetša ngwana kliniking ya mahlo kgwedi le kgwedi goba o kgopela motho o mongwe go ba mofelegetsi?

Ke isa ngwana kgwedi le kgwedi	1
Ke fela ke kgopela motho o mongwe	2
Kgwedi le kgwedi ke kgopela motho wa go fapania	3
Kgwedi tse dingwe ngwana o hloka mofelegetsi	4

12. Go ya ka tebelelo ya gago, na ngwana wa gago o fiwa kalafo ya mahlo ye e swanago goba e fapania go ya ka dikgwedi?

Kalafo e ya swana	1
Kalafo e fapania go ya ka dikgwedi	2
Kalafo e ya fapania nako le nako	3
Ka nako tse dingwe ga go na kalafo	4

13. Naa ke wena o thušago ngwana ka kalafo ya mahlo?

Eng	1
Aowa, go na le yo a mothušago ka gae	2
Ga gona motho yo a mo thušago ka gae	3

14. Naa ngwana wa gago o šomisa kalafo ya mahlo ga kae ka letšatši?

Ga tee ka letšatši	1
Ga bedi ka letšatši	2
Ga raro ka letšatši	3

Karolo C: Tsebo ya motswadi/mohlokomedи

15. Naa lebetlelo la sehlare sa go rothetša ka mahlong le swanetše go lahlwa ka morago ga matšatši a masome a mararo (kgwedi) le butšwe?

Eng	1
Aowa	2
A ke tsebe/ A ke ne bonnete	3

16. Ge o rothetša sehlare sa mahlo ka mahlong, ntlhana ya lebotlelo e swanetše go kgoma leihlo la ngwana, matsogo goba go gongwe le go gongwe?

Eng,	1
Aowa	2
A ke tsebe/ A ke ne bonnete	3

17. Ge ngwana wa gago a ka emiša go šomiša kalafo ya mahlo, bolwetši bja gagwe bo ka tswelapele bo sa kaonafale?

Eng	1
Aowa	2
A ke tsebe/ A ke ne bonnete	3

18. Naa bana ba gago ka moka ba le VKC bjaneng bja bona?

Eng	1
Aowa	2
E tshela bana	3

19. Le ya tseba gore bolwetši bja mahlo ba VKC ke bjo bo bjang?

Eng	1
Aowa	2

20. Ge go hwetšwa gore ngwana wa gago o na le VKC, le hlaloseditšwe gore ke bolwetši bjo bo bjang?

Eng	1
Aowa	2
A ke gopole	3

21. Le filwe letlakala la tshedimošo ka ga bolwetsi bjo gore le bale ka bona gae?

Eng	1
Aowa	2
A ke gopole	3

22. Ge karabo mo potšišo ya 21 ka godimo e le eng, letlakala la tshedimošso le be
le ka leleme le fe?

Sepedi	1
Seisimane	2
Tše dingwe	3

Ke ya leboga

MAFELELO

APPENDIX C

Patient A

Present Condition of the eyes	Onset of eye problem (Year)	Onset of eye treatment (Year)	Medication in terms of Months						Other diseases
			1	2	3	4	5	6	

APPENDIX D

University of Limpopo: Consent Form for conducting research

Dear Sir/Madam

I am Maifadi Khomotso Valecia and I'm a student at the University of Limpopo studying for a Master's Degree in Public Health (MPH). My research seeks to find the factors which contribute to poor treatment outcome of vernal keratoconjunctivitis (VKC) in children. The research will be conducted at the Eye Clinics at Lebowakgomo and Zebediela Hospitals in the Lepelle-Nkumpi Municipality, Limpopo Province, South Africa.

I kindly request you to answer and complete a questionnaire which has a list of questions that asks brief information about yourself and your child to help the health care providers and the Department of Health understand factors which contribute to poor treatment outcome of VKC in children. The whole questionnaire will take 10 minutes to answer and complete. All the information provided about yourself and your child will be kept strictly confidential. To ensure that you remain anonymous, your name and your child's name will not be written down.

It is completely your choice to participate or not participate in this study. Participation is completely voluntary. You are also at liberty to withdraw from participation at any time. Refusal and withdraw from participation will not be used against you in any way.

Should you have any queries about the research study please do not hesitate to contact me at 0156331800 Ext 4332 or via email at valemaifadi@gmail.com. If you would like to participate in the study, please indicate so by signing the consent form below as this will allow us to proceed with the questionnaire.

Yours Truly
Maifadi K.V

Consent Form

I Ms./ Mrs./ Mr./ Dr./ Prof.....would like to participate in the research study: Factors contributing to poor treatment outcome of vernal keratoconjunctivitis in children in the Lepelle-Nkumpi Municipality, Limpopo Province, South Africa.

Signature: Date: Place.....

APPENDIX E (TLEALELETŠO E)

Yunibesithi ya Limpopo: Sepedi Consent Form

Setatamente sa tumelelo mabapi le go tšea karolo ka go porojeke ya dinyakišišo.

Thobela Morena/Mohumagadi

Leina la ka ke Maifadi Khomotšo Valecia, ke moithuti Yunibesithi ya Limpopo mo ke ithutelago dithuto tša godimo tša maphelo a setšhaba (Public Health). Leina la dinyakišišo tša ka ke dintlha tše di na go le seabe go se kaonafaleng ga bolwetši bja mahlo (Vernal keratoconjunctivitis) mo baneng. Dinyakišišo tše di tlo direga dikliniking tša mahlo mo sepetlele sa Lebowakgomo le sa Zebediela, tše di lego masepaleng wa Lepelle-Nkumpi, porobentsheng ya Limpopo, nageng ya Afrika Borwa.

Le kgopelwa ka boikokobetšo go araba le go tlatša letlakala la di potšišo tša go ithuta. Letlakala la dipotšišo tša go ithuta le na le dipotšišo tše di nyakišišago bonnyane ka ga lena le bana ba lena go thuša go fa tshedimošo go bašomi ba tša maphelo le kgoro ya tša maphelo ka dintlha tše di nago le seabe go se kaonafaleng ga bolwetši bja mahlo bja VKC mo baneng. Letlakala la dipotšišo tša go ithuta le tlo tše metsetso e lesome fela go le araba ka botlalo. Tshedimošo ye e filwego ke lena mabapi le bana ba lena e tlo ba ya sephiri, e ka se botšwe motho. O kgopelwa go se ngwale leina la gago goba la ngwana wa gago mo letlakaleng le la dipotšišo tša go ithuta gore le se ke la tsebjwa.

Ke kgetho ya gago go tše karolo goba go se tše karolo mo dinyakišišong tše. O lokologile go gana goba go ikgogela morago mo dinyakišišong tše, gomme seo se ka se šomišwe kgahlanong le wena. Ge le kaba le dipotšišo dife goba dife ka ga dinyakišišo tše, le seke la dikadika go ikopanya lenna ka mogala mo nomorong ye: 0156331800 Ext 4332 goba ka go ngwala email mo go: yalemaifadi@gmail.com. Ge o rata go ba karolo ya dinyakišišo tše, saena setatamente se sa tumelelo ka ge seo se tlo re dumelela go tšwela pele ka letlakala la di postšišo tša go ithuta.

Wa Lena

Maifadi K.V

Setatamente sa tumelelo mabapi le go tšeа karolo go porojeke ya dinyakišišo.

Nna Ms./ Mrs./ Mr./ Dr./ Prof.....nka rata go tšeа karolo mo
dinyakišišong tše: Dintlha tše di nago le seabe go se kaonafaleng ga bolwetši ba mahlo ba
VKC mo baneng, masepaleng wa Lepelle-Nkumpi, porobentsheng ya Limpopo, nageng ya
Afrika Borwa.

Mosaeno:.....Letšatšikgwedi:.....Lefelo.....

APPENDIX F

Request for permission to conduct a research study at Lebowakgomo Hospital.

Maifadi K.V

Po Box 1013

Lebowakgomo

0737

To: Dr Modiba A.

Chief Executive Officer

Lebowakgomo Hospital

Re: Request for permission to conduct a research study and collect data.

I am Maifadi Khomotso Valecia and I'm a student at the University of Limpopo studying for a Master's Degree in Public Health (MPH). I have to conduct a research study as part of the course.

My research is about factors which contribute to poor treatment outcome of vernal keratoconjunctivitis (VKC) in children. The research study will be conducted at the Eye Clinics at Lebowakgomo and Zebediela Hospitals in the Lepelle-Nkumpi Municipality, Limpopo Province, South Africa.

I humbly request your permission to conduct this research study in your Hospital.

Thank You in advance

Yours Truly

Ms Maifadi K.V

0156331800 Ext 4332

Request for permission to conduct a research study at Zebediela Hospital.

Maifadi K.V

Po Box 1013

Lebowakgomo

0737

To: Dr Masemola T.P.M

Chief Executive Officer

Zebediela Hospital

Re: Request for permission to conduct a research study and collect data.

I am Maifadi Khomotso Valecia and I'm a student at the University of Limpopo studying for a Master's Degree in Public Health (MPH). I have to conduct a research study as part of the course.

My research is about factors which contribute to poor treatment of vernal keratoconjunctivitis (VKC) in children. The research study will be conducted at the Eye Clinics at Lebowakgomo and Zebediela Hospitals in the Lepelle-Nkumpi Municipality, Limpopo Province, South Africa.

I humbly request your permission to conduct this research study in your Hospital.

Thank You in advance

Yours Truly

Ms Maifadi K.V

0156331800 Ext 4332

APPENDIX G: Approval letters to collect data

TREC



University of Limpopo
Department of Research Administration and Development
Private Bag X1106, Sovenga, 0727, South Africa
Tel: (015) 268 2212, Fax: (015) 268 2306, Email:noko.monene@ul.ac.za

TURFLOOP RESEARCH ETHICS COMMITTEE CLEARANCE CERTIFICATE

MEETING: 06 May 2015

PROJECT NUMBER: TREC/46/2015: PG

PROJECT:

Title: Factors contributing to poor treatment outcome of vernal Keratoconjunctivitis in children in the Lepelle-Nkumpi Municipality Limpopo Province, South Africa
Researcher: Ms KV Maifadi
Supervisor: Mr MP Kekana
Co-Supervisor: N/A
Department: Medical Sciences, Public Health and Health Promotion
School: Health Sciences
Degree: Masters in Public Health


PROF TAB MASHEGO
CHAIRPERSON: TURFLOOP RESEARCH ETHICS COMMITTEE

The Turfloop Research Ethics Committee (TREC) is registered with the National Health Research Ethics Council, Registration Number: REC-0310111-031

Note:

- i) Should any departure be contemplated from the research procedure as approved, the researcher(s) must re-submit the protocol to the committee.
- ii) The budget for the research will be considered separately from the protocol.
PLEASE QUOTE THE PROTOCOL NUMBER IN ALL ENQUIRIES.



DEPARTMENT OF HEALTH

Enquiries: Latif Shamila

Ref:4/2/2

Mafledi KV
University of Limpopo
P.O.Box 1013
Lebowakgomo
0737

Greetings,

RE: Factors contributing to poor treatment outcome of vernal Keratoconjunctivitis in children in the Lepelle-Nkumpi Municipality Limpopo Province, South Africa.

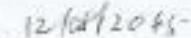
The above matter refers

1. Permission to conduct the above mentioned study is hereby granted.
2. Kindly be informed that:
 - Research must be loaded on the NHRD site (<http://nhrd.hsc.org.za>) by the researcher.
 - Further arrangement should be made with the targeted institutions.
 - In the course of your study there should be no action that disrupts the services.
 - After completion of the study, a copy should be submitted to the Department to serve as a resource.
 - The researcher should be prepared to assist in the interpretation and implementation of the study recommendation where possible.
 - The above approval is valid for a 3 year period.
 - If the proposal has been amended, a new approval should be sought from the Department of Health.

Your cooperation will be highly appreciated.



Head of Department



Date

Lebowakgomo Hospital



LIMPOPO
PROVINCIAL GOVERNMENT
REPUBLIC OF SOUTH AFRICA

Lebowakgomo Hospital

ENQUIRIES: MS M.O MALATJI
CONTACT NO: 0156331800 EXT 4359
DATE: 02/03/2016

TO: Maifadi M.V

Re: Request for permission to conduct a research study and data collection.

Thank you for choosing Lebowakgomo Hospital to conduct your research. We have received your protocol titled: Factors which contribute to poor treatment outcome of vernalkeratoconjunctivitis (VKC) in children.

We have also received all the necessary documentation and as Ethics and Research committee considered your application. We are happy to inform you that your application has been successful.

Please inform us of your presence when you start with your research.

Wishing you the best in your endeavors.

Ethics, research and adverse events committee.

Signature.....


(Coordinator)

Zebediela Hospital



LIMPOPO
PROVINCIAL GOVERNMENT
REPUBLIC OF SOUTH AFRICA

DEPARTMENT OF HEALTH

TEL: (015) 662 0787



ZEBEDIELA HOSPITAL
PRIVATE BAG X342
GOMPIES
0631

FAX: (015) 662 0173/0108



Date: 03 January 2016

Ref: 03/01/16 /1

Enq: DR T P M Masemola

From: The Chief Executive Officer
Zebediela Hospital

To: Maifadi K V
University of Limpopo
P O Box 1013
Lebowakgomo, 0737

**PERMISSION TO CONDUCT RESEARCH AT ZEBEDIELA HOSPITAL:
YOURSELF.**

1. Your application letter on the above matter, refers.
2. I am glad to confirm the permission granted you to do research at Zebediela hospital as requested.
3. And do, hereby, further confirm, our conditions , as follows:
 - 4.1 No action should disrupt service delivery at Zebediela hospital and its subsidiary service points,
 - 4.2 Adherence to the full research ethics, including obtaining of consent from the targeted participants.

Wishing you well in your study

Yours in Health Service Delivery


CHIEF EXECUTIVE OFFICER

LIMPOPO PROVINCE
DEPARTMENT OF HEALTH
03 FEB 2016
PRIVATE BAG X 342 GOMPIES 0631
CEO
ZEBEDIELA HOSPITAL

Editor's confirmation letter

Fax: 01526828683174
Tel. 0152862684
Cell: 0822198060
Rammalaj@ul.ac.za

Dr J R Rammala
440B Mankweng
Box 4019
Sovenga
0727

To whom it may concern

20 June 2017

Confirmation letter: MAIFADI KHOMOTSO VALECIA, (200501566)

Dear Sir/Madam

This memo serves to confirm that I edited a dissertation by the above-mentioned candidate entitled: **Factors contributing to poor treatment outcome of vernal keratoconjunctivitis in children in the Lepelle-Nkumpi municipality, Limpopo Province, South Africa.**

Editing was done on language, typesetting and technical appearance. There were not so many language errors but a few on agreement and tense. Technically the document was well written and not much was done in this area except rearranging headings and subheading in accordance with rules for the University of Limpopo Research Administration and Development. The bibliography is well written and only a few were corrected for spacing and alignment.

I confirm that the document is now readable and clean with regard to language issues and recommend that it can be submitted for assessment.

Thanks

Signed:

Dr J R Rammala