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**"Blur Perception in Myopes, Emmetropes, and Post- - LASIK
subjects."**

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Abstract

Blur Perception in Myopes, Emmetropes, and Post- LASIK subjects.

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May 2021

Preface

The study “Blur Perception in Myopes, Emmetropes, and Post-LASIK subjects” was conducted as a requirement for the award of Master of Optometry degree at Manipal College of Health Professions/Manipal Academy of Higher Education, Manipal University.

The study consists of two sections, Chapter-A and Chapter-B. The first portion of the study, Chapter-A, captures the essential evidence on Blur Perception of Myopes and emmetropes as a systematic review of existing scientific literature on Blur perception and Blur adaptation in myopic and emmetropic subjects which can be used to understand the underlying mechanisms of Myopia development and myopia progression.

The second part of the study is an experimental approach to understand the presence of innate blur adaptation mechanisms of myopic subjects. We used a psychophysical experiment to understand the effects of adaptation on blur thresholds of 3 categories of subjects; Myopes, Emmetropes, and subjects who underwent LASIK correction for Myopia. Subjects who have undergone LASIK treatment were chosen as they had once been myopes and it gives a unique insight into the blur adaptation effects on the blur threshold and can provide additional evidence to assert the hypothesis that blur

adaptation is an innate neural mechanism/compensatory mechanism which plays a role
in myopic

Abstract - Chapter- 1

Blur Perception without and with blur adaptation - A Systematic Review

Purpose: To conduct a systematic review of studies that describe blur perception without and with blur adaptation among emmetropic and myopic subjects.

Method: A literature search was conducted in the following databases: PubMed, CINHAL, Scopus, Google Scholar, and Cochrane Library. Randomized and Non-randomized Clinical trials, Interventional studies, and original research articles with quantifiable results were chosen. Studies on Myopia treatment and intervention were also included. Duplication of relevant research literature was checked using Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA). Case-control studies chosen from the literature were assessed for quality using the Critical Appraisal Skill Program (CASP).

Results: 6 articles were chosen each for Part A (Without adaptation) and Part B (With Adaptation) out of the relevant literature after clearing out duplicates and article screening. Previous studies show the evidence of changing Depth of Focus more significantly seen among the Myopes than emmetropes. Also, the blur thresholds are

reported to be much higher among myopes which imply the reduced sensitivity to changes in blur levels.

Conclusion: The studies analyzed in the review show evidence of reduced threshold among myopes and increased Depth of Focus for myopes. The change in perception due to adaptation is discussed intensively in the literature suggesting the need for further experiments to study the innate adaptation levels of myopes and emmetropes.

Abstract - Chapter- 2

Comparison of Blur perception in Myopes, Emmetropes, and Post-LASIK patients

Myopes have higher blur thresholds indicative of reduced blur sensitivity because of their altered visibility. Constant viewing of a clear or blurred image creates changes in the perception of the image and makes a person more insensitive to blur. This study investigates that if, intrinsic noise plays a role in the causation of myopia. Accordingly, the current study quantified the blur perception post-adaptation to various images for emmetropes (3 subjects; 20-35 years), myopes (3 subjects; 20- 35 years and 1 post LASIK subject (26years). Blur discrimination thresholds were tested using the 2-alternate forced-choice paradigm (2AFC). Myopes had higher blur thresholds to blurred images than emmetropes which agreed with previous studies indicating that they do not have any shift when adapting to such low spatial frequencies. Interestingly the post LASIK subject was much adapted to higher spatial frequencies and provided responses that were divergent from myopes indicating that blur sensitivity is an intrinsic factor in myopes.