A SURVEY OF DILATION PRACTICES OF MICHIGAN OPTOMETRISTS

By

Denise Duffy

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APPROVED:

[redacted]

Faculty Advisor:

ACCEPTED: [redacted]

Faculty Course Supervisor

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A Survey of Dilation Practices of Michigan Optometrists

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5/1/15
Date

ABSTRACT

Background: Optometrists were not always permitted to dilate patients, but it is now considered an important part of a comprehensive ocular examination. This study looks at dilation practices of optometrists currently licensed and practicing in Michigan. This study may help establish clinical guidelines for practicing optometrists and new graduates. *Methods:* A short survey was developed to collect data regarding demographics and dilation practices of Michigan optometrists. The survey was hosted by surveymonkey.com and distributed through the Facebook group "ODs on Facebook". When responding, participants were asked to answer with regards to a 30-50 year old, asymptomatic, generally healthy patient. *Results:* 76 surveys were analyzed for gender, age, year of graduation, optometry school attended, and mode of practice. Chi Square test of independence was run for all of the above categories in relation to frequency of dilation. The results of Chi Square testing showed the following p-values: gender – $p=0.40$, age – $p=0.17$, year of graduation – $p=0.0001$, optometry school attended – $p=0.58$, mode of practice – $p=0.02$. Year of graduation and mode of practice were found to be statistically significant while gender, age, and school attended were not. *Conclusions:* While gender, age, and optometry school attended were not statistically significant, this can be seen as a positive for the profession as there is no influence on the frequency of dilation based on gender, age, or optometry school attended. Also, 76% of participants dilated at least every 2 years, which aligns with American Optometric Association Clinical Guidelines.

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CHAPTER 1

INTRODUCTION

Pupillary dilation is considered to be an important part of eye care today, although optometrists were not always permitted to dilate their patients. Pupillary dilation consists of using pharmaceutical agents (tropicamide, phenylephrine, cyclopentolate, etc.) to chemically induce a state of mydriasis in the iris, causing the pupil to enlarge. Rhode Island was the first state to pass laws permitting optometrists to use diagnostic pharmaceutical agents (DPAs) in 1971.[1] Michigan passed laws permitting optometrists use of DPAs in 1984.

Dilation allows a less obstructed view of the posterior segment of the eye, which can help to identify abnormalities within this area much more easily than through an undilated pupil. It aids in the detection of retinal holes, tears, and detachments, and allows better views to properly diagnose and treat ocular diseases such as glaucoma, macular degeneration, hypertensive retinopathy, and diabetic retinopathy.

In schools today, optometry students are often taught to dilate every patient, every time, but this may not always be possible in a real world setting. According to the American Optometric Association (AOA) Evidence-Based Clinical Practice Guidelines for a Comprehensive Adult Eye and Vision Examination there is a consensus that pharmacologic dilation is necessary for a thorough examination but there is a lack of published research to either support or refute this statement.[2] These guidelines also offer recommendations for how frequently patients should have a comprehensive eye

examination. For patients 18 to 39 years of age who are asymptomatic and low-risk, examinations are recommended at least every two years. This recommendation is also consensus-based with lack of supporting published research.[2] For patients 40 to 64 years of age that are asymptomatic and low-risk, examinations are recommended at least every two years as well. This recommendation, however, does have supporting research in Cohort studies.[2]

A study by Paul Varner looked at patients who had a dilated examination and ten years later received another dilated exam. This study was conducted at a Veterans Affairs Medical Center with subjects being predominately elderly male and looked for incidences of new peripheral retinal findings in these subjects. The study determined that 69% of these patients had unremarkable peripheral retinal findings.[3] In this ten year time frame 29 new retinal detachments were noted, 26 of them being symptomatic for floaters and/or flashes. Four new intraocular tumors were noted, with three being symptomatic for visual field changes.[3] The conclusions of this study stated that routine dilation is not indicated for older, asymptomatic patients due to the lack of remarkable retinal changes in an asymptomatic patient.

Another study by Pollack and Brodie looked to estimate the risk of missing retinal abnormalities in asymptomatic patients when they are not dilated. This was a retrospective study of 1094 records that found 30 (2.73%) patients with clinically significant retinal abnormalities. Of these, only 3 (0.274%) were located outside the view of a direct ophthalmoscope.[4] These studies raise the question of how often younger, healthy patients should be dilated.

With the advent of new technology, such as retinal photography, it is possible that optometrists may be less likely to dilate patients and, instead, opt to utilize this technology to view the posterior segment. This, however, presents challenges in detecting abnormalities within the peripheral retina, which is much more difficult to view with an undilated pupil. This paper will look at how frequently Michigan optometrists dilate the "average" healthy adult patient.

CHAPTER 2

METHODS

A short survey was used to collect data regarding dilation practices of optometrists currently licensed and practicing in the state of Michigan. This survey was developed by Denise Duffy and Dr. Dean Luplow. The survey was hosted online by surveymonkey.com. This site collected and stored completed survey data by converting each participant to a number. No names, e-mail addresses, or IP addresses were collected, making the survey anonymous. The survey was distributed by use of the Facebook group "ODs on Facebook", where Michigan optometrists were asked to complete the survey. Before taking the survey participants were informed of the nature of the survey and its use for research and consented to participant in the survey/research study. When responding to the survey participants were asked to consider a patient between the ages of 30 and 50 years without any major medical or ocular issues (diabetes, macular degeneration, etc.) and without any ocular symptoms or complaints. The survey consisted of seven basic questions regarding age, gender, year of graduation, optometry school attended, current mode of practice, dilation practices, and alternative methods to view the posterior segment undilated (see Appendix B for full survey).

CHAPTER 3

RESULTS

Of the 77 participants that completed the survey only one was not a currently licensed and practicing optometrist in the state of Michigan. This participant was therefore excluded from data analysis. Of the 76 participants included in data analysis 52% were female and 48% were male. Practitioner age groups were broken down into decades, with the 30-39 year age range containing the highest (30%) number of participants. The 20-29 year group contained 17% of participants, 40-49 years contained 16%, 50-59 years contained 16%, and 60+ years contained 22%.

Year of practitioner graduation was also broken down into decades, with 2010-2015 containing the most participants at 26%. 2000-2009 contained 25% of participants, 1990-1999 contained 16%, 1980-1989 contained 16%, 1970-1979 contained 17%, 1960-1969 contained 0%, and 1950-1959 contained 2%. The participants represented six different optometry schools with 66% graduating from the Michigan College of Optometry (MCO). 22% graduated from the Illinois College of Optometry (ICO), 6% from the Ohio State University College of Optometry (OSU), 3% graduated from the Southern College of Optometry (SCO), and 1.5% each graduated from Pennsylvania College of Optometry (PCO) and Indiana University College of Optometry (IU).

For mode of practice a majority (62%) were in private practice. This was further divided into type of private practice with 39% of participants in a group private practice and 23% in a solo private practice. 17% were in OD/MD practices, 10% in commercial practices, 4% were in a Veteran's Affairs (VA) setting and 6% in an educational setting.

The most common frequency of dilation reported was every 2 years by 40% of participants. Similarly, 36% of participants stated they dilated the proposed patient every year. Participants that dilated every three to five years accounted for 17% of the total participants. Only 4% dilated every six to ten years and 3% stated they dilated every 11+ years. Tables were created to compare these variables as to how frequently participants dilated the proposed patient and can be seen in tables 1-5. These tables were then used in Chi Square tests of independence to determine statistical significance.

Table 1. Comparison of practitioner gender and frequency of dilation.

	Every year	**Every 2 years**	**Every 3-5 years**	**Every 6-10 years**	**Every 11+ years**	**Totals**
Male	15	12	6	2	2	37
Female	13	19	7	1	0	40
Totals	28	31	13	3	2	77

Table 2. Comparison of practitioner age and frequency of dilation.

	Every year	**Every 2 years**	**Every 3-5 years**	**Every 6-10 years**	**Every 11+ years**	**Totals**
20-29	4	5	4	0	0	13
30-39	10	10	3	0	0	23
40-49	3	5	3	1	0	12
50-59	3	8	1	0	0	12
60+	8	3	2	2	2	17
Totals	28	31	13	3	2	77

Table 3. Comparison of practitioner year of graduation and frequency of dilation.

	Every year	Every 2 years	Every 3-5 years	Every 6-10 years	Every 11+ years	Totals
1950-1959	0	0	0	0	1	1
1960-1969	0	0	0	0	0	0
1970-1979	5	3	2	2	1	13
1980-1989	4	7	1	0	0	12
1990-1999	5	4	2	1	0	12
2000-2009	8	8	3	0	0	19
2010-2015	6	9	5	0	0	20
Totals	28	31	13	3	2	77

Table 4. Comparison of practitioner optometry school attended and frequency of dilation.

	Every year	Every 2 years	Every 3-5 years	Every 6-10 years	Every 11+ years	Totals
MCO	19	21	10	1	0	51
ICO	7	5	2	1	2	17
OSU	2	2	0	1	0	5
SCO	0	1	1	0	0	2
PCO	0	1	0	0	0	1
IU	0	1	0	0	0	1
Totals	28	31	13	3	2	77

Table 5. Comparison of practitioner mode of practice and frequency of dilation.

	Every year	Every 2 years	Every 3-5 years	Every 6-10 years	Every 11+ years	Totals
Solo PP	9	2	4	2	1	18
Group PP	7	15	8	0	0	30
OD/MD	4	9	0	0	0	13
Commercial	2	3	1	1	1	8
VA	1	2	0	0	0	3
Educational	5	0	0	0	0	5
Totals	28	31	13	3	2	77

For the comparison of gender and dilation frequency Chi Square testing revealed a p-value of 0.40, showing that gender does not influence dilation frequency to a statistically significant degree. A p-value of 0.17 was found for Chi Square testing of age

and frequency of dilation. This is also not statistically significant. Chi Square testing P-values for comparison of dilation frequency and year of graduation and dilation frequency and optometry school attended were 0.0001 and 0.58, respectively. Mode of practice and dilation frequency was 0.02. Year of graduation and mode of practice were found to be statistically significant, while optometry school attended was not.

Participants were also asked what their most commonly used method was to view the posterior segment undilated. A majority of participants, 68%, stated they performed undilated slip lamp fundoscopy. 16% stated they performed direct ophthalmoscopy, 14% obtained retinal photos, and 2% stated they dilated all patients and did not view the fundus undilated.

CHAPTER 4

DISCUSSION

Of the 77 participants, one was not a licensed and practicing optometrist in the state of Michigan. As the survey was posted in a Facebook group containing members throughout the country it was expected that some would complete the survey even though they did not meet the criteria for survey completion. This was accounted for by specifically asking if the participant was a licensed and practicing Michigan optometrist, allowing for exclusion of participants not meeting the inclusion criteria.

In terms of gender distribution, the results were slightly skewed toward female over male. Historically, optometrists were predominately males, but females have begun to surpass males in this field in recent years. It was expected that the largest representation for age was the 30-39 year group, as this age group makes up a large portion of the work-force. It was interesting that the 60+ year group was second highest at 22%. This may indicate that optometrists continue practicing throughout their lifetime, and continue to practice even past what most consider "retirement age." It was also unexpected to see that the graduation years of 2010-2015 has the highest participation at 26%, especially since the 30-39 year group was highest for age. This may indicate that some participants may have chosen optometry as a second career or started schooling later in life.

It was not surprising that a majority (66%) of the participants were graduates of MCO, as this is the only optometry school in the state of Michigan. ICO and OSU are

the two closest optometry schools outside of Michigan, so it would make sense that they were the next two schools with the highest representation. The distribution of participants by mode of practice was also expected with a majority (62%) in a private practice setting and far fewer in a VA (4%) or educational (6%) setting. This is expected due to the relative availability of job opportunities in the private sector versus a VA or educational setting. This is particularly true for an educational institution as stated previously, since there is only one college of optometry in the state of Michigan.

The fact that the most common response for frequency of dilation was 2 years at 40%, with yearly dilation second most common at 36% is also expected. As stated earlier, the AOA Clinical Guidelines state that asymptomatic patients age 18-39 and 40-64 should have a comprehensive ocular examination at least every two years.[2] Therefore, 76% of participants in this survey are following the guidelines set by the AOA.

Responses for alternative methods to view the posterior segment undilated showed that undilated slit lamp fundocsopy was most common (68%) and direct ophthalmoscopy was second most common. This is not surprising as these are often the first methods taught in optometry school.

Chi Square testing of the data categories collected were found not to be statistically significant for age, gender, and optometry school attended. This means that these categories do not have an influence on how often a Michigan optometrist dilates the "average" patient. However, Chi Square testing for year of graduation was found to be

statistically significant (p=0.0001). It is surprising that year of graduation is statistically significant, while practitioner age is not. These two categories generally correlate as older optometrists typically graduated earlier. It is possible that optometrists that graduated earlier and did not learn to dilate patients in optometry school do not dilate as often. But, 73% of participants graduating between 1950 and 1989 dilate the "average" patient at least every two years.

Chi Square testing for mode of practice was also found to be statistically significant (p=0.02). However, an additional Chi Square test with the solo and group private practice numbers combined to reflect total private practice participants yields a p-value of 0.11 which is not statistically significant. The investigators believe the difference between these two is that fact that participants in group private practice most commonly dilated the "average" patient every two years (50%), while those in solo private practice most commonly dilated yearly (50%). The investigators can only speculate as to why optometrists in group private practices dilate less frequently than those in solo private practice.

In terms of the survey, a few changes could have been made to improve it. It may have been beneficial to ask how often other patient demographics are dilated, including children and those with conditions that may affect ocular health. Distributing the survey by other means, possibly through the Michigan Optometric Association (MOA), may have yielded more responses and possibly a different distribution of responses.

Further research should be conducted in the future, preferably on a larger scale, to continue investigations into dilation practices of optometrists to help establish clinical

guidelines for the profession as a whole and to new graduates just starting their careers in the optometric profession. Further research as to the need of dilation based on patient outcomes is also necessary to help establish these clinical guidelines.

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APPENDIX A

IRB APPROVAL FORM

FERRIS STATE UNIVERSITY

Institutional Review Board for Human Subjects in Research

Office of Research & Sponsored Programs, 220 Ferris Drive, PHR 308 - Big Rapids, MI 49307

Date: January 28, 2016

To: Dr. Dean Luplow and Ms. Denise Duffy

From: Dr. Gregory Wellman, IRB Chair

Re: IRB Application #160106 (*A Survey of Dilation Practices of Michigan Optometrists*)

The Ferris State University Institutional Review Board (IRB) has reviewed your application for using human subjects in the study, "*A Survey of Dilation Practices of Michigan Optometrists*" (#160106) and determined that it meets Federal Regulations *Exempt-category 1C*. This approval has an expiration date of three years from the date of this letter. **As such, you may collect data according to the procedures outlined in your application until January 28, 2019.** Should additional time be needed to conduct your approved study, a request for extension must be submitted to the IRB a month prior to its expiration.

Your protocol has been assigned project number (#160106), which you should refer to in future correspondence involving this same research procedure, and has been approved with the following contingency that must be followed:

The contingency is the informed consent should be incorporated into the actual Survey Monkey online survey rather than an attachment to the Facebook post. This will ensure that each subject who participates in the survey understands its content. This can be done by inserting a page at the beginning of the survey and utilizing the text that you have in the attached document. Add a check box to allow the subject to acknowledge they have read and understood it.

Approval mandates that you follow all University policy and procedures, in addition to applicable governmental regulations. Approval applies only to the activities described in the protocol submission; should revisions need to be made, all materials must be approved by the IRB prior to initiation. In addition, the IRB must be made aware of any serious and unexpected and/or unanticipated adverse events as well as complaints and non-compliance issues.

Understand that informed consent is a process beginning with a description of the study and participant rights, with the assurance of participant understanding followed by a signed consent form. Informed consent must continue throughout the study via a dialogue between the researcher and research participant. Federal regulations require each participant receive a copy of the signed consent document and investigators maintain consent records for a minimum of three years.

As mandated by Title 45 Code of Federal Regulations, Part 46 (45 CFR 46) the IRB requires submission of annual reviews during the life of the research project and a Final Report Form upon study completion. Thank you for your compliance with these guidelines and best wishes for a successful research endeavor. Please let us know if the IRB can be of any future assistance.

[redacted]

[redacted] Review Board

Office of Research and Sponsored Programs

APPENDIX B

DILATION SURVEY

A Survey of Dilation Practices of Michigan Optometrists

Principal Investigator: Denise Duffy
Email: duffyd2@ferris.edu

Faculty Advisor: Dean Luplow, OD
Email: DeanLuplow@ferris.edu Phone: (231) 591-2192

You are invited to participate in a voluntary online survey about dilation practices of optometrists licensed and practicing in the state of Michigan. Researchers are interested in identifying a possible standard for frequency of dilation of healthy adult patients and identifying any trends in frequency of dilation based on the age of the doctor, optometry school attended, or mode of practice. We estimate that it will take approximately 5 minutes to answer the survey questions. Once you begin the survey, you must answer all questions. If you do not wish to answer a question you may exit the survey at any time and none of your responses will be recorded. Information collected will benefit new graduates and practicing optometrists by helping to establish norms for dilation frequency, and the study will present no greater risk to individuals taking the survey than what one encounters in daily life. The survey data will be collected anonymously and the topic of dilation frequency is not sensitive. There is no compensation for participating in this survey. Participation or nonparticipation in this study will not impact your relationship with Ferris State University in any way. If you have questions about this study, please contact the Faculty Advisor, Dean Luplow, OD, listed above. If you have questions about your rights as a participant, contact the Ferris State University Institutional Review Board (IRB) for Human Participants at: 220 Ferris Drive, PHR 308, Big Rapids, MI 49307 (231) 591-2553 or IRB@ferris.edu.

You may print or save a copy of this page for your records.

1. Do you confirm you have read and understand the previous informed consent test?
    a. Yes
    b. No
2. Are you a licensed and practicing optometrist in the state of Michigan?
    a. Yes
    b. No

3. What is your gender?
    a. Male
    b. Female
4. What is your age?
    a. 20-29
    b. 30-39
    c. 40-49
    d. 50-59
    e. 60+
5. What year did you graduate optometry school? _____
6. What optometry school did you graduate from?
    a. Michigan College of Optometry
    b. Illinois College of Optometry
    c. Ohio State University College of Optometry
    d. Southern College of Optometry
    e. Other: _____
7. What mode do you practice in?
    a. Solo Private Practice
    b. Group Private Practice
    c. OD/MD
    d. Commercial
    e. Veterans Administration
    f. Educational setting
    g. Other
8. How often do you dilate an asymptomatic, 30-50 year old, generally healthy patient?
    a. Every year
    b. Every 2 yrs
    c. Every 3-5 yrs
    d. Every 6-10 yrs
    e. Every 11+ years
9. What is your most commonly used method to view the fundus undilated?
    a. Undilated slip-lamp fundoscopy
    b. Retinal photos
    c. Direct ophthalmoscopy
    d. Other: _____