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A survey of patient reaction to hydrophilic contact lenses

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A survey of patient reaction to hydrophilic contact lenses

Abstract

A survey of patient reaction to hydrophilic contact lenses

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A SURVEY OF PATIENT
REACTION TO HYDROPHILIC
CONTACT LENSES

A Thesis

Presented to
the Faculty of the School of Optometry
Pacific University

In Partial Fulfillment
of the Requirements for the Degree
Doctor of Optometry

by

Louis M. Montes

James J. Murphy

Jay R. Musson

Gary C Patton

April 1972

Accepted by the faculty of the College of Optometry,
Pacific University, in partial fulfillment of the require-
ments for the Doctor of Optometry degree.

Richard D. Repton

Director of thesis

Thesis Chairman

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INTRODUCTION

The first production and subsequent testing of the hydrophilic contact lens took place in Czechoslovakia in 1960. The material which the Czechs used was a copolymer of glycol monomethacrylate. Those early lenses were generated by a spin casting process and they had no specific base curves. It was not long after this time that other people recognized the potential of such an ophthalmic device and research was taken up in several other countries. Many different materials and methods of production were pursued. Bausch and Lomb started refining the Czech lens and came up with the poly-(2-hydroxyethyl methacrylate) "Soflens". This lens was also produced by a spin-casting process but came in only three base curves. A clinical evaluation was initiated in late 1968. This evaluation was followed by the Food and Drug Administration and was terminated in March of 1971 upon F.D.A. approval of the "Soflens" for distribution to the professions. In this clinical evaluation "Strict protocols for fitting patients and reporting patient visits were drawn and agreed to by each clinical investigator."³

As with the advent of any new product, the hydrophilic lens has been met with mixed reactions. It has only been a little more than twelve months since the F.D.A. ruling that approved the hydrophilic contact lens for consumer use. This is an appropriate time to make an evaluation of patient accep-

tance and handling of the hydrophilic contact lens. A survey of a more general population than patients and Doctors which were working under "strict protocols" may well reveal information that could be useful in management of hydrophilic contact lens problems.

METHOD

The method used in gathering the information for this thesis was a survey conducted through the mail. Eighteen pertinent questions were compiled and assembled on one page. The first seventeen questions were multiple choice type questions which we felt could be answered easily and with a minimum amount of inconvenience to the persons being surveyed. The last question was a general comment type question where the person being surveyed could submit any additional information or criticism if he wished to do so. A copy of the questionnaire is shown in Appendix A.

The questionnaires were mailed individually to persons who now wear or have worn Bausch and Lomb "Soflens" contact lenses. The sample was obtained from two practices. Practice A was a downtown high volume practice and Practice B was a suburban low volume practice. Practice A contributed 130 patients names which consisted of all the "Soflens" patients they had fit up to that time. Practice B contributed twenty patients which was all they had fit up to that time except for a few that were still in progress. It was explained to the practitioners at the time we obtained their patients names that there would be no way to separate the responses from the persons surveyed and that the objective for the survey was not to compare results from different practices but to simply get the general reaction from the "Soflens" contact lens wearers. Since

neither Practice A nor Practice B had selectively screened the patients they gave us and since we did get almost all of the "Soflens" contact lens patients they had fit up to that time, we felt that the sample would adequately fulfill our objective.

The persons surveyed were between ten and fifty-six years of age. Forty-six of those surveyed were females and 104 were males. A total number of 150 questionnaires were sent, along with a self addressed, stamped, return envelope so they could be easily returned. Eighty-six completed questionnaires were returned.

STATISTICAL DATA

1A. Age Distribution

<u>Ages</u>	<u>Frequency</u>
Below 14	2
15	5
16	1
17	2
18	0
19	0
20	4
21	3
22	5
23	4
24	4
25	3
26	7
27	4
28	2
29	8
30	2
31	2
32	1
33	1
34	3
35	2
36	2

<u>Ages</u>	<u>Frequency</u>
37	2
38	1
39	0
40	1
41	0
42	1
43	2
44	0
45	2
46	0
47	2
48	0
49	0
50	2
Above 50	6

Mean age - 29.69

Median age - 29.0

1B. Sex Distribution

Males - 26	30.2%
Females - 60	69.8%

2. How long have you been wearing your soft lenses?

1-3 months	16	18.6%
3-6 months	28	32.5%
6-12 months	42	49.0%
over 1 year	0	00.0%

3. How many hours each day do you wear them on the average?

0-4 hours	5	5.8%
4-10 hours	17	19.7%

10-15 hours	45	52.5%
15 & up	19	22.0%

4. Do you think the price was too high?

yes	60	70.0%
no	26	30.0%

5. What did you wear before your soft lenses?

hard lenses	32	37.2%
glasses	51	59.3%
nothing	3	3.5%

6. Which do you like best?

soft lenses	72	84.0%
hard lenses	1	1.1%
glasses	4	4.7%
nothing	7	8.1%

7. Where did you hear about the soft lens?

advertising	47	55.0%
a friend	20	23.3%
your doctor	23	26.8%
other	4	4.7%

8. To what degree do you follow the lens care and wearing program?

100% of the time	65	75.5%
75% of the time	18	21.0%
50% of the time	0	00.0%
10% of the time	3	3.5%

9. Has it been necessary to receive medical attention as a result of wearing soft lenses?

yes	6	7.0%
no	80	93.0%

10. Are you ever bothered by foreign material getting under the lenses?

yes	16	18.5%
no	70	81.5%

11. When, if ever do you experience a blur? (check as many as apply)

never	8	28.0%
while reading	26	12.4%
while driving	16	7.6%
during 1st. hr.	13	6.2%
after many hours	52	24.8%
far to near	13	6.2%
near to far	10	4.8%
near work	21	10.0%
looking at far	7	3.3%
indoors	12	5.2%
outdoors	13	5.7%
other	18	8.5%

12. When, if ever, do you experience discomfort or pain? (check as many as apply).

never	29	25.4%
daytime	5	4.4%
nighttime	9	7.9%
indoors	7	6.1%
outdoors	4	3.5%
when reading	9	7.9%
when in wind and dust	25	21.9%

13. With your soft lenses do straight lines ever appear bent or curvy?

all the time	0	00.0%
never	83	96.7%
I've gotten used to it	3	3.3%

14. Have your soft lenses ever come loose accidentally?

yes	19	22.0%
no	67	78.0%

15. Have you ever had to replace your soft lenses?

yes	33	38.4%
no	53	61.5%

16. Would you recommend soft lenses to your friends?

yes	78	90.5%
no	8	9.5%

17. How much longer do you plan to wear your soft lenses?

forever	79	96.5%
don't know	1	1.1%
quit	2	2.4%

Success versus nonsuccess. (see text for criterion for success)

Success	62	72.1%
Nonsuccess	24	27.9%

Success versus age.

<u>Age</u>	<u>Success Frequency</u>	<u>Nonsuccess Frequency</u>
under 14	2	0
15	4	1
16	1	0
17	1	1
18	0	0
19	0	0
20	4	0
21	3	0
22	4	1
23	3	1
24	3	1
25	2	1
26	5	2
27	3	0
28	1	1
29	6	2
30	0	2

<u>Age</u>	<u>Success Frequency</u>	<u>Nonsuccess Frequency</u>
31	1	1
32	1	0
33	1	0
34	0	3
35	2	0
36	2	0
37	1	1
38	0	1
39	0	0
40	1	0
41	0	0
42	0	1
43	1	1
44	0	0
45	2	0
46	0	0
47	2	0
48	0	0
49	0	0
50	2	0
over 50	3	3

Hours of wearing time versus sex:	<u>male</u>	<u>female</u>
0-4 hours of wearing time	3	1
4-10 hours	3	16
10-15 hours	13	30
15 and up	7	13

Success-nonsuccess versus previous prescription form:

	<u>Successful</u>		<u>Nonsuccessful</u>	
Hard contact lenses	23	37.1%	11	45.8%
Glasses	37	58.7%	13	54.2%
Nothing	2	3.2%		

Success-nonsuccess versus degree of care:

	<u>Successful cases</u>		<u>Nonsuccessful cases</u>	
100% care	49	80.6%	16	66.7%
75% care	12	17.7%	6	24.0%
50% care	0	00.0%	0	00.0%
10% care	1	1.6%	2	8.0%

Number of
Wearers
Surveyed

Mean Age - 29.69 years
Median Age - 29

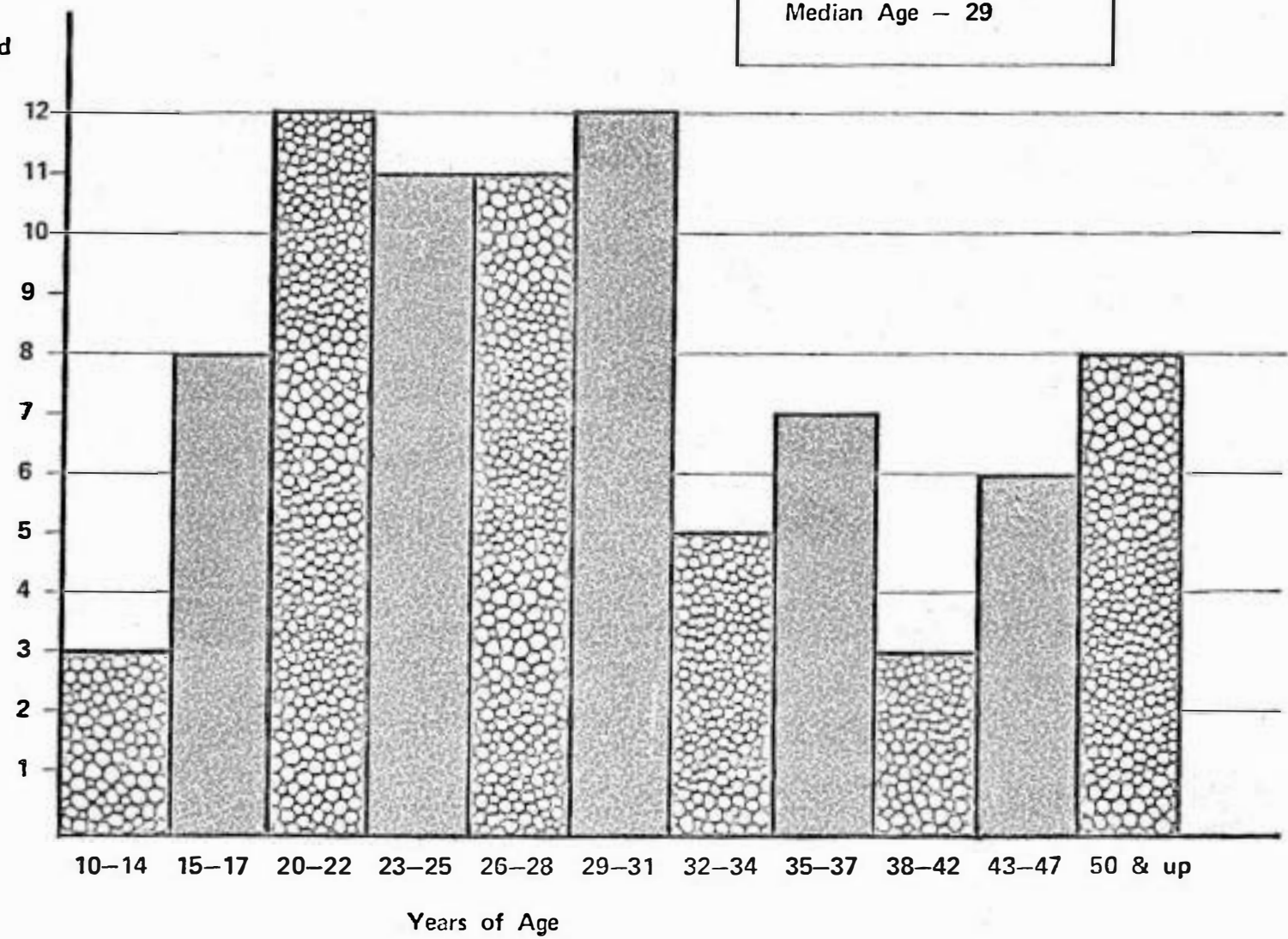


Figure No. 1 - AGE DISTRIBUTION OF SOFT LENS WEARERS

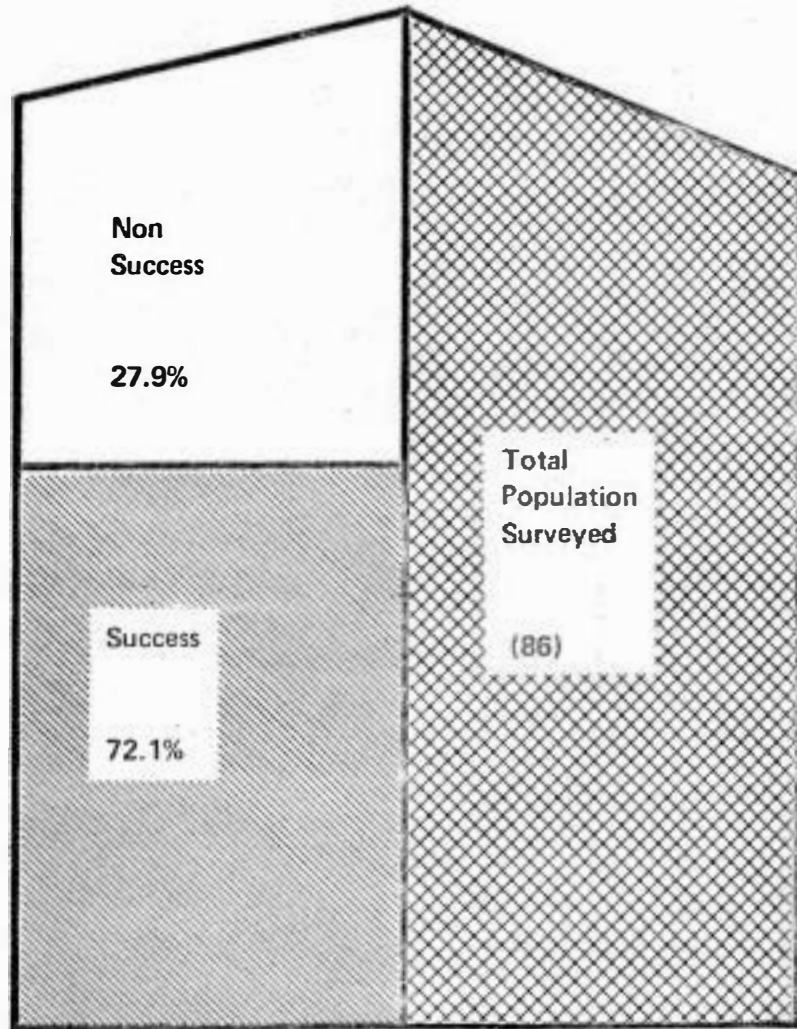


Figure No. 2 – GRAPHIC REPRESENTATION OF SUCCESS/NON-SUCCESS IN POPULATION SURVEYED.

RESULTS AND DISCUSSION

As with conventional lenses the majority of wearers appear to be females. From the comments of the patients questioned, this ratio may be due to cosmetic factors. The median age of twenty nine reflects that hydrophilic lenses compared to spectacles and even conventional contact lenses are still relatively expensive and the average teenager does not have quite the means for what many people would consider a luxury item.

Since hydrophilic lenses have only been on the market a short while an analysis of long term effects is impossible and the patients questioned had for the most part been wearing their lenses somewhere between six and twelve months. Most wore their lenses more than ten hours per day and there was a significant number who wore their lenses primarily for cosmetic purposes or for sports and were perfectly satisfied with short wearing periods and did not desire to increase their wearing time.

The average price for hydrophilic lenses paid by these patients was around \$265 (this was the suggested price of practitioner A from which the larger sample was taken). Seventy percent decided that this price was too high and some remarked that the price seemed all out of proportion when considered in the light of apparently low material costs and what seemed to them a rather quick and simple fitting procedure from the optometrist.

Most of the patients formerly wore glasses and about 37% previously wore conventional contact lenses many of whom were unsuccessful in their own estimation. In fact only 1.1% actually preferred "hard" lenses where 84% were in favor of the hydrophilic lenses. Only 4.7% preferred glasses and 8.1% preferred wearing nothing. One must remember, however, that after paying \$265 most people are not going to turn around right away and admit that their \$30 glasses were better. Also it is apparent that some people probably answered "nothing" meaning they would rather be an emmetrope instead of the intended meaning that they would rather stumble around in myopia than wear any sort of correction whatsoever. Even with the figures thus tempered it remains clear that the hydrophilic lens was an overwhelming favorite over conventional contact lenses, glasses, or ametropia.

Most of the patients questioned first heard of the hydrophilic lenses through advertising with Time Magazine taking top honors followed by television coverage. So it seems that the major manufacturers have wasted no time in getting their products known not only to the practitioners but also to the general public.

The criteria for a "successful" wearer in this study are; 1) a positive attitude towards the lenses, 2) no major complaints of blur, pain, or discomfort, 3) a wearing schedule of ten hours per day or more with the exception of those who

stated that they only desired brief wearing schedules.

The cleaning and sterilization of hydrophilic lenses is a problem that has stirred much controversy. Phares³ suggests that "cleaning soft lenses is a bigger and more difficult problem than was heretofore realized." He goes on to demonstrate that in the two major lenses on the market (which are essentially the same material) there are no pores large enough to allow penetration by bacteria. However, he states "the porosity of lenses can indirectly increase the chances of microbiological contamination. Various components of the tears might be absorbed into the lens through the pores and then serve as a reservoir of nutrient materials which could be utilized by surface bacteria."

Over 75% of the patients reported that they followed the cleaning and sterilization as recommended by the manufacturer to the letter 100% of the time.

The 100% care category accounted for 80.6% of the successful wearers and 66.7% of the unsuccessful wearers. In contrast the 75% category was responsible for only 17.7% of the successful wearers and a larger 24% of the failures, thus clearly showing the role played by proper cleaning and sterilization procedures. The fact that 7% reported seeking medical attention as a result of wearing hydrophilic lenses does not indicate any major hazard, however, the figure is a little higher than one would like to see.

The most frequent complaint of 18.5% of the patients who reported foreign material getting under the lens was that while cleaning and rinsing the lenses with saline it was nearly impossible to get that last little bit of lint clear of the lens.

When asked of blurring problems 28% said they did not experience any, about one fourth mentioned blur after many hours of wear and also complained of dehydration. About 10% of the population experienced blur during near work and while reading.

One fourth of the group stated that they never experienced any pain or discomfort while about 22% complained of discomfort in the wind and dust, particularly the wind. This is a departure from conventional lenses which are usually the most comfortable in the wind.

This problem is most probably due to the fact that both lens and cornea have the ability to draw in water, a property that Dr. Irving Fatt describes as "imbibation pressure". The dehydration of the lens by the wind causes an unequal gradient at the lens-corneal interface and a net movement of water out of the cornea and into the lens.¹

There did not seem to be any difficulty with distortion or if there was it might have fallen into the "blur" category. 22% of the sample reported the lenses coming loose but in most cases this meant coming off center rather than completely loose from the eye which is sometimes a problem with conventional lenses.

Tearing of the lens material seemed to be a consistent problem and this combined with power changes were responsible for 38.4% of the patients requiring new lenses in a period of less than a year.

The most surprising factor of all to this investigator is the unabashed enthusiasm for the new type of lenses on the part of the patients. Nine out of ten would recommend hydrophilic contact lenses to their friends and furthermore when asked how much longer they intended to wear their new lenses 96.5% of the patients gushed "forever!"

REFERENCES

1. Fatt, Irving PhD., "Some Effects of the Gel Contact Lens on Corneal Physiology" Journal of the American Optometric Association, V. 43, No. 3, March 1972.
2. Knoll, Henry A. and Clements, Dean L. "The Hydrophilic Contact Lens: A Clinical Study" Journal of the American Optometric Association, March 1972.
3. Phares, Russell E. PhD., "Soft Lens Care", Journal of the American Optometric Association, V. 43, No. 3, March 1972.

APPENDIX A

Dear soft lens wearer;

We are doing a study of the practical results in fitting the hydrophilic soft contact lenses here at the Pacific University, College of Optometry. Information of this nature will be beneficial to both the practitioner and the patient and we have come to you for your practical experience in the day to day handling of these lenses. The information you provide will aid in research and improvement on the soft lenses. Please fill in the following questions and mail this form back to us in the envelope provided as soon as possible.

1. Age _____ Sex _____
Occupation _____
2. How long have you been wearing your soft lenses?
 1-3 months, 6-12 months,
 3-6 months, over 1 year.
3. How many hours each day do you wear them on the average?
 0-4 hours, 10-15 hrs.,
 4-10 hours, 15 & up.
4. Do you think the price was too high?
 Yes, No.
5. What did you wear before your soft lenses?
 hard lenses, nothing.
 glasses,
6. Which do you like best?
 soft lenses, glasses,
 hard contacts, nothing.
7. Where did you hear about the soft lens?
 advertising, your doctor,
 a friend, other _____.
8. To what degree do you follow the lens care and wearing program?
 100% of the time, 50%,
 75%, 10%.
9. Has it been necessary to receive medical attention as a result of wearing your soft lenses?
 yes, no.
if yes what for _____.
10. Are you ever bothered by foreign material getting under the lenses?
 yes, no.
11. When, if ever do you experience a blur? (check as many as apply).
 never, near work,
 while reading, looking at far,
 while driving, indoors,
 during 1st. hr., outdoors,
 after many hrs.,
 looking far to near,
 looking near to far,
 other _____.
12. When, if ever, do you experience discomfort or pain? (check as many as apply).
 never, outdoors,
 daytime, when reading,
 nighttime, when in dust
 indoors, and wind,
 other _____.
13. With your soft lenses do straight lines ever appear bent or curvy?
 all the time,
 never,
 I've gotten used to it.
14. Have your soft lenses ever come loose accidentally?
 yes, no.
15. Have you ever had to replace your soft lenses?
 yes, no.
if yes what for _____.
16. Would you recommend soft lenses to your friends?
 yes, no.
17. How much longer do you plan to wear your soft lenses?
_____.

Please write any additional comments or criticisms regarding soft contact lenses that you think we ought to know.

Thank you for your cooperation.