ORIGINAL ARTICLE

Awareness, Perception, and Knowledge of Amblyopia among the Community in Madinah, Saudi Arabia: A 2020 Study

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Abstract

An analytical cross-sectional study was carried out, and was conducted to assess the knowledge, awareness, and perception about amblyopia among the community in Madinah, Saudi Arabia, during February 2020. A total of 633 who satisfied the inclusion criteria were acquired. A chain sampling technique was carried out. Structured valid questionnaire (in Arabic) were distributed to the respondents using (WhatsApp) application. The collected data were analyzed by appropriate statistical tests. Results showed that of the 633 participants, only one-third (33.8%, n = 214) mentioned that they are knowledgeable about this condition. Of them, one-fourth (27.6%) had a correct knowledge about the definition of amblyopia with (29.8%) who identified refractive errors, strabismus and cataract as etiologies of amblyopia and (84.1%) mentioned early treatment as more effective. Results showed that respondents with higher education level (64.3%), who were in health-related field (44.8%) and parents who had amblyopic children (70.4%) were found to have more significant awareness ($p < 0.05$). In conclusion, low awareness on amblyopia was found to be common topic among previous and current researches in relation with the disease. This gap in awareness can be minimized by directing more efforts to provide a greater reach on disease information dissemination. Public campaigns are deemed vital in promoting more information about the disease.

Keywords

Amblyopia; Awareness; Knowledge; Perception; Saudi Arabia

Introduction

Amblyopia is an eye condition characterized by a decrease in best-corrected visual acuity of one or both eyes wherein an anomaly in the eye's structure cannot be ascribed solely to it[1]. This is also the major cause of visual impairment (unilateral). Being one of the most typical public health problems, reports show that up to 5% of the population are at risk of acquiring this condition, making it critical especially for the children[2]**.** Also, this may occur from four-month- up to eight years of age at which the development of normal cortical visual pathways are hindered. Lower efficacy of treatment is expected if left untreated prior to the central vision development at nine years old age below[3]. Amblyopia can be classified as monocular and binocular. Monocular-type are due to deprivation, anisometropia and strabismus while high refractive errors are largely considered as cause of binocular-type[4].

This eye condition is treated by deprivation of the better eye vision, eradication of amblyopic eye suppression and doing visual exercises which helps in recovery of the amblyopic eye's visual acuity[5]. Patching, which primarily depends on compliance and ranges from one hour to full-time occlusion, is included as one of the treatment for such eye condition[6]. Most affected children can have significant visual improvement with early detection and appropriate, timely therapy[7].

Amblyopia has detrimental effect on quality of life of the children who were diagnosed with this condition. Some of which are that it can affect the ability of the patients to engage in sports, other physical and social activities, as well as their choice of career path in the future[8,9]. In addition, it can cause them depression or anxiety[10].

Both the concerned child and parents play significant role in complying for the prescribed treatment, having the success to be influenced by the perception of parents. Parents can refer to their own experiences (e.g. patching/glasses-wear), as well being knowledgeable about condition and the significance of the treatment. Other studies also mentioned parents' understanding of the condition and belief in the set treatment are crucial for successful treatment compliance[11]. Thus, studies on assessment of parent's level of awareness towards amblyopia and its awareness improvement are necessary.

Previous population-based reports in countries such as Australia, United States, and Singapore and Taiwan show 0.8 – 2.6% prevalence of amblyopia in preschool children[12]. In Saudi Arabia, variations (by regions) in the prevalence were observed, reporting 1.3% in Jeddah[3], 2.6% in Riyadh[13], 3.9% in Qassim province[14] and 1.9% in Abha[15]. Such differences can be attributed to variations in both definitions and cutoff points of visual parameters used as basis in describing the characteristics of amblyopia and the studied patients. Studies reveal that the extent of awareness in amblyopia in Riyadh, Saudi Arabia (30%)[13] were found to be of higher rate than the awareness reported in India (3%)[16] and Jeddah, Saudi Arabia (10%)[8].

With our knowledge, this is the 1st study that focused on the assessment of knowledge, awareness, and perception towards amblyopia among the community of Madinah, Saudi Arabia.

Material and Methods

An analytical cross-sectional study was carried out, and was conducted to assess the knowledge, awareness, and perception about amblyopia among the community in Madinah, Saudi Arabia. Participants less than 18 years old were excluded. Sample size was measured using Raosoft calculator (Raosoft.com) with an estimated total population of 20,000, prevalence (of the problem) of 50%, confidence level of 95% and error of 5%. The calculated sample size was 377 participants, adding 10% to compensate for the defaulters and non-responders. Therefore, the total sample size was rounded up to 415 participants. With consideration to possible variation in population size, a total of 633 who all satisfied the inclusion criteria were acquired. A chain sampling technique was carried out where any participant could recommend additional subjects from among their acquaintances.

Structured valid questionnaire (in Arabic) were distributed to the respondents. The form is composed of three section, namely (1) general background questions, (2) awareness of amblyopia and (3) perception about amblyopia treatment and the source of knowledge. The survey was uploaded online, and no log-in restrictions were made. Distribution was done using an accessible social media (WhatsApp) application. Only those who received the link could access the questionnaire. Possible duplicates were prevented by providing a "bold type" note at the start of

the survey informing participants to avoid responding again after successfully accomplishing the 1st survey. The collected data were entered via personal computer to SPSS version 25. Chi-square test, t-test and other appropriate tests were used for data analysis, having p value of < 0.05 as basis of significance.

Results

Demographic characteristics

In the assessment of demographic characteristics, a total of 633 participants responded to the questionnaire. Of those, 67.8% (n = 429) were female and 32.2% (n = 204) were male (Table 1). The majority (97%, n = 614) were of Saudi nationality, while only 1.6% were Yemeni (n =10) and 1.4% were of other nationalities. The mean age of the participants was 36.22 ± 10.5 years and 70.5% (n = 446) of them were married. In terms of level of education, roughly three-fourth (74.4%, n = 471) had a Bachelor's degree, while only 21.2% (n = 134) had High School degree or lower and 4.4 % (n = 28) had higher education degree. A total of 81.7% (n = 517) did not correlate to a health field. Among the total participants, 36% (n = 228) had family history of eye diseases.

Awareness, Perception and Diagnosis of Amblyopia

When it comes to awareness, perception and diagnosis of amblyopia, around two-third of the participants reported that they do not know what amblyopia is (66.2%, n = 419), while only one-third (33.8%, n = 214) mentioned that they are knowledgeable about this condition (Table 2). In terms of the risk age group of

Table 1. Demographic characteristics of the studies population (N = 633)

Characteristics		Frequency	%	Valid %	Cumulative %
Sex	Female	429	67.8	67.8	67.8
	Male	204	32.2	32.2	100.0
	Total	**633**	**100.0**	**100.0**	
Nationality	Barmawi	2	0.3	0.3	0.3
	Egyptian	1	0.2	0.2	0.5
	Iraqi	2	0.3	0.3	0.8
	Jordanian	2	0.3	0.3	1.1
	Palestinian	1	0.2	0.2	1.3
	Saudi	614	97.0	97.0	98.3
	Sudanese	1	0.2	0.2	98.4
	Yamani	10	1.6	1.6	100.0
	Total	**633**	**100.0**	**100.0**	
Age (in years)	18-24	83	13.1	13.1	13.1
	25-34	213	33.6	33.6	46.8
	35-44	177	28.0	28.0	74.7
	45-54	123	19.4	19.4	94.2
	55-64	36	5.7	5.7	99.8
	≥65	1	0.2	0.2	100.0
	Total	633	100.0	100.0	
Marital status	Divorced	21	3.3	3.3	3.3
	Married	446	70.5	70.5	73.8
	Single	157	24.8	24.8	98.6
	Widow	9	1.4	1.4	100.0
	Total	**633**	**100.0**	**100.0**	
Academic level	Bachelor's degree	471	74.4	74.4	74.4
	High school	115	18.2	18.2	92.6
	Higher education	28	4.4	4.4	97.0
	Intermediate school	19	3.0	3.0	100.0
	Total	**633**	**100.0**	**100.0**	
Related to health field	No	517	81.7	81.7	81.7
	Yes	116	18.3	18.3	100.0
	Total	**633**	**100.0**	**100.0**	
Family history of eye diseases	No	405	64.0	64.0	64.0
	Yes	228	36.0	36.0	100.0
	Total	**633**	**100.0**	**100.0**	

Table 2. Definition, risk group and diagnosis of amblyopia

Characteristics		Frequency	%	Valid %	Cumulative %
Aware of what Amblyopia is?	No	419	66.2	66.2	66.2
	Yes	214	33.8	33.8	100.0
	Total	633	100.0	100.0	
Who is affected by Amblyopia?	Children	144	22.7	22.7	22.7
	Children and adults	256	40.4	40.4	63.2
	Adults	36	5.7	5.7	68.9
	I don't know	197	31.1	31.1	100.0
	Total	633	100.0	100.0	
Who diagnoses Amblyopia?	Ophthalmologist, GP, family medicine	112	17.7	17.7	17.7
	GP, family medicine	8	1.3	1.3	19.0
	Ophthalmologist	427	67.5	67.5	86.4
	I don't know	86	13.6	13.6	100.0
	Total	633	100.0	100.0	

Table 3. Characteristics of children with amblyopia

Characteristics		Frequency	%	Valid %	Cumulative %
Do you have children?	No	237	37.4	37.4	37.4
	Yes	396	62.6	62.6	100.0
	Total	**633**	**100.0**	**100.0**	
How many times you take them to ophthalmologist or optometrist?	Every 1 year	54	13.6	13.6	21.0
	Every 2 years	35	8.8	8.8	29.8
	Every 6 months	29	7.3	7.3	7.3
	Never	230	58.1	58.1	100.0
	Once in a lifetime	48	12.1	12.1	41.9
	Total	**396**	**100.0**	**100.0**	
Do you have an amblyopic child?	I don't know	90	22.7	22.7	22.7
	No	280	70.7	70.7	93.4
	Yes	26	6.6	6.6	100.0
	Total	**396**	**100.0**	**100.0**	
Number of amblyopic children	1	17	65.4	65.4	65.4
	2	8	30.8	30.8	96.2
	5	1	3.8	3.8	100.0
	Total	**26**	**100.0**	**100.0**	
Age of amblyopic patients (in years)	Median (range= 0; 23)	9.50	100.0	100.0	

amblyopia, 40.4% (n = 256) answered that it might occurred both in children and adults, and majority (67.5%, n = 427) of the participants believed that it could only be diagnosed by ophthalmologists.

Nearly two-third (62.6%, n = 396) of the respondents had children and more than half of them (58.1%, n = 230) mentioned that had no opportunity to bring their children to an ophthalmologist or an optometrist (Table 3). With regards to having amblyopic child, majority of the parents (70.7%, n = 280) confirmed that their children were not described as such while only 22.7% (n = 90) were not sure and 6.6% (n = 26) had children with confirmed amblyopia. Of those parents with amblyopic children, around two-third (65.4%, n = 17) responded to either have one son or daughter with the said condition, while 30.8% (n = 8) of the parents specifically reported that they have two children with amblyopia, and 3.8% (n = 1) mentioned that they have five children who had it. Also, these amblyopic patients were found to fall at the age range of 2 and 23 years old. Figure 1 shows the distribution of participants on the frequency of bringing their respective amblyopic children to ophthalmologist- or optometrist- clinics. The figure revealed that around one-third (34.6%, n = 9) visited the clinic once a year, followed by 30.8% (n = 8) who visited the clinics for every 6 months, roughly one-fourth (26.9%, n = 7) with every 3-month visit and 7.7% (n = 2) with visits every 2 years.

For the other 37.4% (237) of the participants who had no children, 13.5% (n = 32) of them reported that

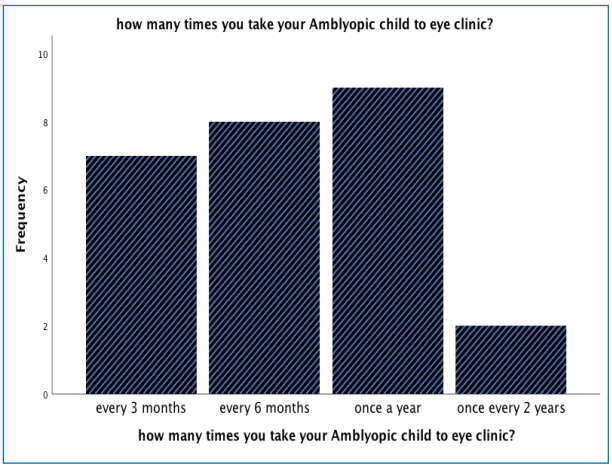


Figure 1. Frequency distribution of parents' amblyopic children's visit to ophthalmologist- or optometrist- clinics.

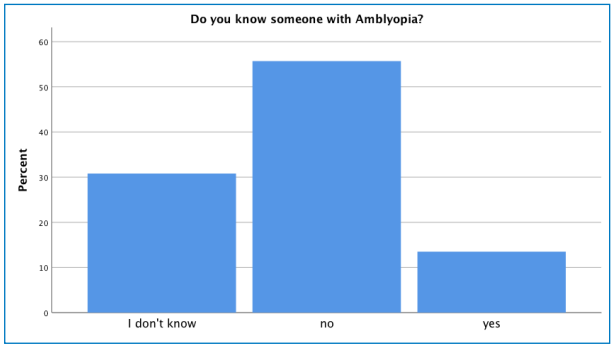


Figure 2. Frequency distribution of the knowledge of participants about someone with amblyopia.

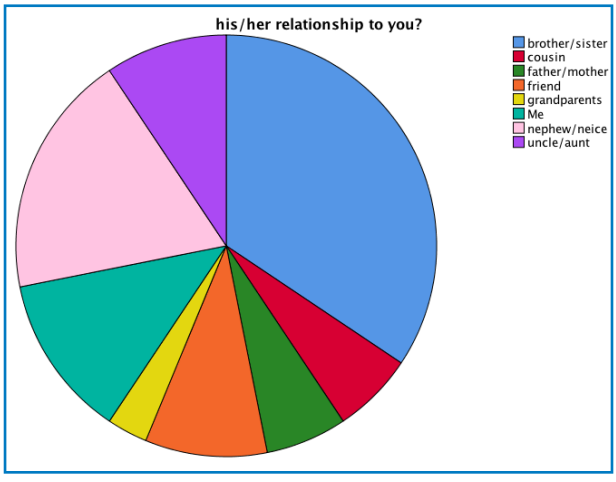


Figure 3. Frequency distribution of the participants in terms of their relationship to someone with amblyopia.

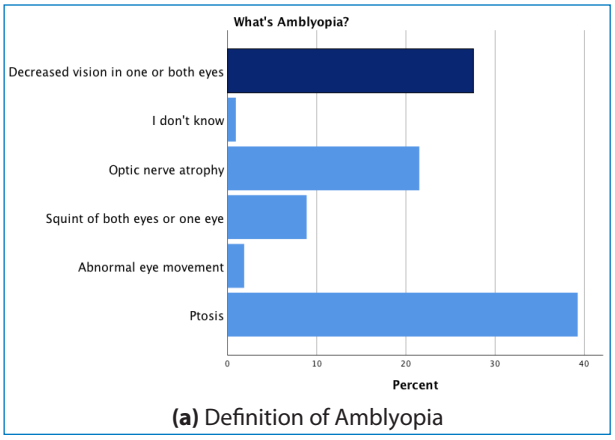
they knew someone with amblyopia (Figure 2). Around one-third of them had a relationship with these individuals as siblings (34.4%, n = 11), while only 18.8% as nephew or a niece (n = 6), 9.4% (n = 3) as uncle or aunt, 9.4% (n = 3) as friend, 6.3% (n =2) as parent, 6.3% (n = 2) as cousin and 3.1% (n = 1) as grandparent (Figure 3). Exactly one-eight (12.5%, n = 4) of the distribution were affected themselves.

Knowledge about amblyopia:

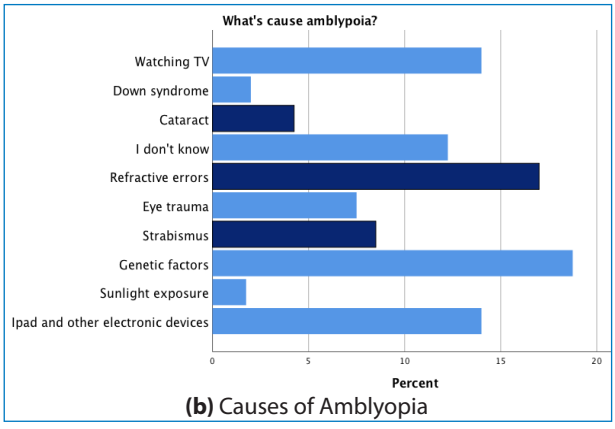
The knowledge of the respondents who had awareness towards amblyopia were further assessed in terms of three sections, namely (1) definition and characteristics, (2) etiologies/causes and (3) options for treatment. Figure 4 shows the frequency distribution of participants on their knowledge about the definition, causes and treatment options of amblyopia. Roughly one-fourth (27.6%) of the respondents had a correct knowledge about the definition of amblyopia, while 39.3% misidentified it as ptosis and 21.5% as optic nerve atrophy. When it comes to etiological knowledge, "refractive errors" was the most frequently identified etiology of amblyopia (17.0%), followed by strabismus (8.5%), and cataract (4.3%). Majority of the participants wrongly perceived the factors such as genetics, television, smart device and sunlight exposures, eye trauma and Down syndrome as etiologies of such eye condition. Knowledge of the respondents towards the treatment options showed that 84.1% ($n = 180$) of them mentioned early treatment as more effective, while only 22.0% considered patching as the curative option and 25.4% mentioning glasses as a possible choice for treatment. Moreover, low percentages of parents had wrong perception on treatment options, mentioning the eye muscle exercise (14.6%,), surgery (14.1%), laser (9.0%) and improvement with time (1.4%) as treatment choices.

Lastly, the basis or source of knowledge of the respondents towards amblyopia was further investigated (Figure 5). Result revealed that more than one-fourth (28.1%) of them mentioned the Internet as their source of knowledge, followed by 21.6% who obtained their knowledge from physicians, 14.7% from friends, 7.2% from relatives, 6.2% from optometrists and 1.7% from awareness campaigns. In addition, 20.5% based their answers just by guessing.

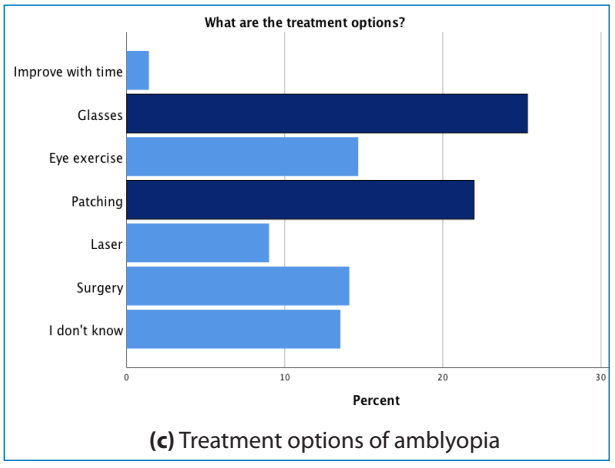
Table 4 shows the association of the background of the respondents with their level of awareness towards amblyopia. Pearson's Chi square test revealed



(a) Definition of Amblyopia



(b) Causes of Amblyopia



(c) Treatment options of amblyopia

Figure 4. Frequency distribution of the knowledge of participants towards the (a) definition, (b) etiology and (c) treatment options of amblyopia.

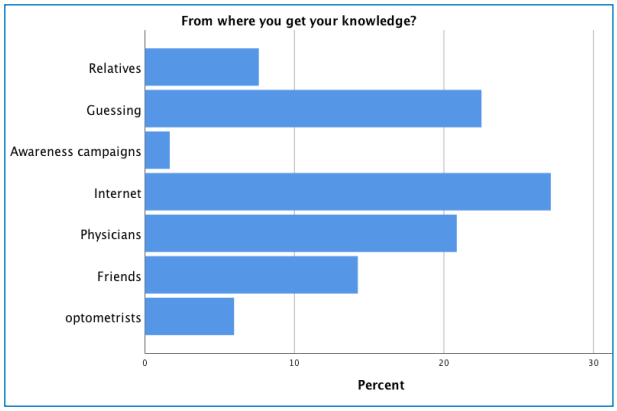


Figure 5. Distribution of sources of knowledge of participants towards amblyopia.

significant differences among the different age groups (p = 0.0003), implying significantly high number of 45-54 years old participants (41.5%, n = 51) in comparison with other age brackets. Using similar test, the "marital status" characteristic was also found to be significantly associated with the participants' awareness about amblyopia (p = 0.042). This result suggests that married participants (37.2%, n = 166) were significantly more aware of the term amblyopia than those with who were divorced and widowed. Significant association of the level of education with the awareness of amblyopia was also observed (p = 0.006). Results showed that respondents with Higher education level exhibited significantly more amblyopic awareness compared to other levels (64.3%, n = 18). On the other hand, participants who were in health-related field had significantly higher awareness (p = 0.005) in comparison with those who were not (44.8%, n = 52). Parents who had children (38.1%, n = 151) significantly exhibited more awareness than non-parents (p = 0.003). Lastly, respondents having amblyopic children (70.4%, n = 19) were found to have more significant awareness compared to those who do not have (p = 0.000). All other characteristics were found to have to significant association (p > 0.05) toward the eye condition, amblyopia.

Discussion

Amblyopia is one of the common public health problems characterized by vision reduction triggered by visual aberrations like anisometropia and strabismus with no apparent eye damage. The disease affects about 5% of the population and develops in the early stages of life before children can even go to school[12]. However, cases related to this disease is frequently

Table 4. Association of baseline characteristics of participants towards the awareness of amblyopia

Characteristics			Awareness of Amblyopia		P-value
			No	Yes	
Age	18-24	Count	68	15	0.003*
		Expected Count	54.9	28.1	
		% within age	81.9%	18.1%	
	25-34	Count	146	67	
		Expected Count	141.0	72.0	
		% within age	68.5%	31.5%	
	35-44	Count	107	70	
		Expected Count	117.2	59.8	
		% within age	60.5%	39.5%	
	45-54	Count	72	51	
		Expected Count	81.4	41.6	
		% within age	58.5%	41.5%	
	55-64	Count	26	10	
		Expected Count	23.8	12.2	
		% within age	72.2%	27.8%	
	≥65	Count	0	1	
		Expected Count	.7	.3	
		% within age	0.0%	100.0%	
Sex	Female	Count	276	153	0.152
		Expected Count	284.0	145.0	
		% within sex	64.3%	35.7%	
	Male	Count	143	61	
		Expected Count	135.0	69.0	
		% within sex	70.1%	29.9%	
Academic level	Bachelor's degree	Count	320	151	0.006*
		Expected Count	311.8	159.2	
		% within Academic level	67.9%	32.1%	
	High school	Count	77	38	
		Expected Count	76.1	38.9	
		% within Academic level	67.0%	33.0%	
	Higher education	Count	10	18	
		Expected Count	18.5	9.5	
		% within Academic level	35.7%	64.3%	
	Intermediate school	Count	12	7	
		Expected Count	12.6	6.4	
		% within Academic level	63.2%	36.8%	
Related to health field	No	Count	355	162	0.005*
		Expected Count	342.2	174.8	
		% within Related to health field	68.7%	31.3%	
	Yes	Count	64	52	
		Expected Count	76.8	39.2	
		% within Related to health field	55.2%	44.8%	
Marital status	Divorced	Count	15	6	0.042*
		Expected Count	13.9	7.1	
		% within Marital status	71.4%	28.6%	
	Married	Count	280	166	
		Expected Count	295.2	150.8	
		% within Marital status	62.8%	37.2%	
	Single	Count	118	39	
		Expected Count	103.9	53.1	
		% within Marital status	75.2%	24.8%	
	Widow	Count	6	3	
		Expected Count	6.0	3.0	
		% within Marital status	66.7%	33.3%	

Table 4. CONTINUATION. Association of baseline characteristics of participants towards the awareness of amblyopia

Characteristics			Awareness of Amblyopia		P-value
			No	Yes	
Family history eye diseases	No	Count	268	137	0.098
		Expected Count	268.1	136.9	
		% within Family history of eye diseases	66.2%	33.8%	
	Yes	Count	151	77	
		Expected Count	150.9	77.1	
		% within Family history of eye diseases	66.2%	33.8%	
Do you have children?	No	Count	174	63	0.003*
		Expected Count	156.9	80.1	
		% within Do you have children?	73.4%	26.6%	
	Yes	Count	245	151	
		Expected Count	262.1	133.9	
		% within Do you have children?	61.9%	38.1%	
Do you have Amblyopic child	I don't know	Count	80	10	0.000*
		Expected Count	55.7	34.3	
		% within Do you have Amblyopic child	88.9%	11.1%	
	No	Count	157	122	
		Expected Count	172.6	106.4	
		% within Do you have Amblyopic child	56.3%	43.7%	
	Yes	Count	8	19	
		Expected Count	16.7	10.3	
		% within Do you have Amblyopic child	29.6%	70.4%	
Do you know someone with Amblyopia?	I don't know	Count	65	8	0.000*
		Expected Count	53.6	19.4	
		% within Do you know someone with Amblyopia?	89.0%	11.0%	
	No	Count	96	36	
		Expected Count	96.9	35.1	
		% within Do you know someone with Amblyopia?	72.7%	27.3%	
	Yes	Count	13	19	
		Expected Count	23.5	8.5	
		% within Do you know someone with Amblyopia?	40.6%	59.4%	

** statistically significant result (p<0.05); test used; chi-square*

underreported. Furthermore, early diagnosis is deemed vital in the proper treatment of amblyopia. If not diagnosed and treated early, this can lead to detrimental impact not just on vision but also on the quality of life of patients with such disease[17].

In this study, the awareness, perception, knowledge on amblyopia were determined among adults in a community in Madinah, Kingdom of Saudi Arabia. Low awareness on amblyopia was apparent as only 1 in every 3 participants have declared their awareness on the said condition. Although majority of the participants believed that the ophthalmologists could diagnose this disease, about 58.1% of all subjects did not bring their children to an ophthalmologist or optometrist. Presence of amblyopic children were only reported by 26 parents with patients age ranging from 2 to 23 years old, as provided in Table 3. One-third of these parents have brought their children to an ophthalmologist or optometrist only once in each year, which was proceeded by 30.8% of the parents who brought their children every 6 months, as shown in Figure 1. For those with no children suffering from amblyopia, about 13.5% of them reported another person with amblyopia, either themselves or other relatives, displayed in Figure 3. Subjects with children suffering from amblyopia as well as those who were associated with the health field were found to be more

aware about amblyopia. Likewise, increased awareness on amblyopia was also observed among those participants who knew other people suffering from the said condition, as provided in Table 4.

Alsaqr and Masmali determined the awareness of amblyopia among 1649 families around Saudi Arabia via a cross-sectional survey study[12]. In this study, about 70% of the participants had no prior information on amblyopia and 313 subjects had no awareness about on their children having amblyopia. This showed a similar trend in terms of awareness for adults in a community in Medina. Moreover, about 3 in every 5 participants did not bring their children to the eye clinic for a routine eye examination. For the remaining 30% of families with awareness on amblyopia, the information they received on amblyopia were primarily obtained from the Internet as well as during visitation periods from the eye clinic. In a familiar sense, more than a quarter of the participants in this study cited the Internet as their principal information source in terms of amblyopia. Cases of children with amblyopia were reported by 140 participants. From this set, tedious eye examinations were conducted by more than half of the children (58.3%) for once in every year, whereas the remainder had their eye examinations twice every year. In contrast, the results of this study revealed a different side as less than half of patients with amblyopia were brought to ophthalmologists for at least once per year.

A related research on the prevalence, knowledge, as well as awareness on amblyopia among attendees in a hospital in Jeddah was conducted by Alzahrani and colleagues[18]. Awareness on the said condition was common among almost half of the participants surveyed (49.7%), which is higher when compared to the results of this study. When compared with the determined results, both studies revealed that the causes of this disease, such as cataract, strabismus, and refractive errors were correctly identified by less than most of the participants. Knowledge on the disease were more common among female subjects, parents, as well as those with history of the said disease. Moreover, awareness on amblyopia was brought upon by conversations with friends and relatives as well as the Internet. In comparison, the conversation with friends and relatives together with the Internet plays a major impact on the information dissemination in relation to amblyopia as about half of those participants who knew this conditions cited these approaches as their key information source.

In the Qassim province, about 5176 children were subjected to eye examination to evaluate the pervasiveness of amblyopia[14]. Results had shown that 3.90% of the children had amblyopia, with significant distribution among children aged between 10-13 years old. Similarly, the average of children with amblyopia determined in this study was 9.50 years old. Unilateral type of amblyopia was common among 5 in every 6 children, with refractive errors as the principal causative agent. In terms of knowledge on causes of amblyopia, refractive errors were cited by only 17% of the study population as factor leading to the said condition.

Focus group discussions were partaken by 16 eye health practitioners and 35 parents in Chennai, India in order to assess their awareness on various eye diseases which are common among children[16,19,20,21]. The results showed the awareness of parents on eye diseases were only limited on common eye-related concerns such as cataract, squint and refractive error. Amblyopia, on the other hand, was somewhat unfamiliar among parents. Likewise, low understanding on the reasons behind these diseases was frequent among parents[16]. In terms of the study results, genetic factors and refractive errors were accounted by more than 15% of the participants as causative agents of amblyopia. In addition, the use of electronic gadgets and TV were also accounted by almost one-tenth of the interviewed respondents. Moreover, food and exercise were somewhat perceived by the parents as treatment for these diseases. Surprisingly, squint was thought of as a symbol of good fortune, whereas stigma from community was perceived by those who sought to correct their eyesight.

Amblyopia has a detrimental effect on the perceived self-esteem of children who were diagnosed with the said condition[22]. In terms of social acceptance, the control group, who had similar age with the amblyopic subjects, scored higher in comparison with the amblyopic patients. However, similar scores were observed among the two groups in terms of physical appearance, self-worth, behavioral conduct, athletic and scholastic competence. Lower scores in social acceptance was attributed with a record of treatment via patching.

Respondent information on amblyopia, which includes definition, etiologies, and treatment options, were assessed as provided in Figure 4. About 1 in every 4 participants have identified amblyopia correctly as

vision decrement in either one or both eyes. However, the said condition was misidentified by about 60.8% of the participants as either ptosis or optic nerve atrophy. Low knowledge on etiologies of amblyopia was also observed as less than 20% of the participants have identified etiologies such as refractive errors, strabismus, and cataract. On an alarming note, majority of the respondents identified other factors such as sunlight exposure, eye trauma, Down syndrome, TV and smart device exposure, and genetic factors as causes that contribute to amblyopia. Early treatment was identified by about 4 in every 5 participants as the most effective treatment for amblyopia, with 22% of them thought of patching as an option for curing amblyopia. As provided in Figure 5, Internet as well as physicians were found to be the leading information sources for knowledge on amblyopia. Amblyopia awareness was more common among subjects aged 45-54 years old, married participants, and those high educational levels.

The deficit of knowledge on amblyopia can pose life-long challenges for patients who have the disease in the early stages of their life. According to the research conducted by Chua and Mitchell, lifetime occupational class was not statistical affected by the presence of amblyopia among subjects[23]. However, completion of degree in university was found to be more difficult for amblyopic subjects. Likewise, there is heightened danger for the better seeing eye to be visually impaired in the next 5 years.

Conclusion

Low awareness on amblyopia was found to be common topic among previous and current researches in relation with the disease. This gap in awareness can be minimized by directing more efforts to provide a greater reach on disease information dissemination. Public campaigns in various media platforms, such as television, radio, and the Internet, are deemed vital in promoting more information and awareness on the disease. Aside from that, the participation of eye care professionals is also needed in disseminating the correct information on amblyopia, either at family level or community-wide platform. Amblyopia, when detected later in life, can affect not only the patient's vision but also his or her overall quality of life. Related studies have reported low self-esteem and fewer career opportunities for people suffering from amblyopia, in comparison to those with normal vision.

Recommendation

Collaboration between government and private institutions is essential in providing widespread information on amblyopia and its treatment. Community-wide screening programs for pre-school children is strongly suggested in order to early detect as well as treat the disease. Emotional support from family, friends, teachers, as well as the community can be of great help in boosting the self-esteem of patients with amblyopia.

Conflict of Interest

The authors declared that there is no conflict of interest that is related to this study and this article.

Disclosure

The authors did not receive any form of commercial support, either in the form of compensation or financial assistance, for this case report. The authors have no financial interest in any of the products, devices, or drugs mentioned in this article.

Ethical Approval

Permission from the ethical research committee in the Ministry of Health in Madinah city was obtained. (IRB 390 Date 09-06-1441)

Consent

Full explanation about the study and its purpose was carried out to all responders and an informed consent was provided online. All collected data and information were handled with confidentially and filling out of name was not required in the questionnaire.

Authors Contributions

Dr. Alahmadi conceived and designed the study, conducted research, provided research materials, collected, analyzed and interpreted data, and also wrote initial and final draft of article. Dr. Aziz collected, analyzed and interpreted data, wrote initial and final draft of article. Dr. Kurdi provided logistic support and wrote final draft of article. All authors have critically reviewed and approved the final draft and are responsible for the content and similarity index of the manuscript.

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