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Original Article

ASSESSMENT OF KNOWLEDGE, BELIEFS AND PRACTICES OF OUR POPULATION REGARDING EFFECTS OF VIEWING A SOLAR ECLIPSE

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ABSTRACT:

Objective: To assess the prevalence of knowledge, beliefs and practices of people coming to The Aga Khan University Hospital, about viewing a solar eclipse.

Methodology: A cross-sectional survey was conducted at The Aga Khan University Hospital, Karachi from January 2000 to April 2000. A self-administered questionnaire was filled by the patient or attendant who were aged 18 and above. Total of 202 respondents were interviewed. The data was analyzed by Epi Info.

Results: Mean age of respondents was 35.8 years. Overall, awareness regarding the harmful effects to their eyes by viewing an eclipse directly was 83.2%. Females were more knowledgeable. Majority had obtained information from TV. One third thought it was safe to view the eclipse through binoculars or through smoked glasses. Half of the respondents thought the same about photographic films and sun-glasses. Viewing an eclipse by a pregnant mother had an adverse effect on the fetus and on herself was thought to be 50% and 45% respectively. Use of knife or scissors by pregnant females at the time of solar eclipse was thought to be harmful for the fetus and to herself by 41% and 38% respectively.

Conclusion: Majority knew that viewing a solar eclipse could be harmful to their eyes but they did not know the safest way. As there is no effective treatment for solar retinopathy, the emphasis should be on prevention. We need to increase public awareness regarding the safest way to watch an eclipse, which is by indirect method using projection. Myths regarding ill effects of solar eclipse on pregnant mother and on fetus need to be removed.

KEY WORDS: Solar Eclipse.

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INTRODUCTION

Solar eclipses are accidents of nature. They occur when the moon is between the Earth & the Sun. There can be as many as seven eclipses (solar plus lunar) in any one year. On an average, there is a total solar eclipse visible somewhere about every 18 months[1].

The sun can be viewed safely with the naked eye only during the few brief seconds or minutes of a total solar eclipse. Partial eclipses, annular eclipses and the partial phases of total eclipses are never safe to watch without taking special precautions[2,3]. Permanent eye damage or blindness may result if appropriate protection is not used. There are two mechanisms of retinal injury from solar radiation. Viewing the sun through binoculars or telescopes

produces 10 - 25° temperature rise in the retina producing a thermal burn. However looking at the sun with the naked eye includes photochemical injury to retinal receptor cells and pigment epithelium, associated with only a 4° rise in retinal temperature[4]. This latter represents the common form of solar retinopathy.

Fractionated exposure may be more damaging than continous and short wavelengths more than long[4]. Children and teenagers are at particular risk because the lens of the eye filters little short wavelength light before the age of 20 years. People who have undergone cataract surgery or with retinal dystrophy or albinism or those taking photosensitizing medication are also at higher risk[5]. There is a variation in susceptibility to solar retinopathy, some individuals are relatively resistant and others develop symptoms after as little as 30 - 60 seconds exposure[6]. No pain is felt at the time of injury. Symptoms take some days to develop and include reduction in visual acuity, central scotomas, impairment of colour vision, and distortion of straight lines. In a study after an eclipse in Turkey in 1976, around 10% of those with damage had permanent visual loss to the extent that they were not able to read a car number plate at 25 yards (23 meters) with the effected eye or eyes[7]. There is permanent loss of the photoreceptors. The condition can occur without pain and without being immediately apparent. This study has been carried out to assess the prevalence of knowledge, beliefs and practices of the population visiting the Community Health Centre about viewing a solar eclipse and to find their source of information, in order to plan effective public health messages.

METHODOLOGY

A Cross-sectional survey was conducted at Community Health Centre of The Aga Khan University Hospital, Karachi from January 2000 to April 2000. Convenience sampling methodology was used and 202 respondents were interviewed after taking verbal consent. The study population was adults more than 18 years of age, both male and female coming to the out

Table - I: Percentage distribution of demographic & socio-economic characteristics of the respondents

Respondent's Characteristics	*Percent*
Age Group (in years)	
<25	18.8
25-34	30.2
35-49	34.2
50-59	11.9
60 & above	5.0
Sex	
Male	32.2
Female	67.8
Marital Status	
Never married	59.9
Ever married	40.1
Occupational Status	
Professional	19.3
Managerial	2.0
Business	7.9
Service related	12.4
Production related	2.0
Housewife/Retired	47.0
Student	9.4
Language spoken at home	
Urdu	63.4
Sindhi	5.0
Punjabi	12.3
Balochi	1.0
Pushto	2.5
Gujrati	15.8
Living in joint family	
Yes	55.4
No	44.5
N	202

patient services of The Aga Khan University Hospital as a patient or as an attendant. A self-administered pre-coded and pre-tested questionnaire (both in English and Urdu) consisting of important demographic characteristics and questions about knowledge, beliefs and practices regarding effects of viewing a solar eclipse was filled by the respondent. During this whole survey, two supervisors checked each questionnaire for completeness. The data was analyzed with the help of Epi-info (version 6.0) program.

RESULTS

A total of 202 respondents were interviewed. Table-I provides the socio-demographic characteristics of the study population.

Table-II: Percentage distribution of knowledge of respondents (with 95% confidence interval) by sex

Characteristics	*Sex*		
	Male (% with 95% C.I.)	*Female (% with 95% C.I.)*	*Both (% with 95% C.I.)*
Awareness that looking at the solar eclipse can damage the eyes			
Yes	76.9(66.7, 87.1)	86.1(80.3, 91.9)	83.2(78.0, 88.4)
No	23.1	13.9	16.8
Binoculars are safe for viewing the solar eclipse			
Yes	30.8(19.6, 42.0)	32.8(24.9, 40.7)	32.2(25.8, 38.6)
No	36.9	43.1	41.1
Don't Know	32.3	24.1	26.7
Photographic film are safe for viewing the solar eclipse			
Yes	55.4(43.3, 67.5)	45.3(37.0, 53.6)	48.5(41.6, 55.4)
No	12.3	29.9	24.3
Don't know	32.3	24.8	27.2
Sunglasses are safe for viewing the solar eclipse			
Yes	38.5(26.7, 50.3)	44.5(36.2, 52.8)	42.6(35.8, 49.4)
No	38.5	40.9	40.1
Don't know	23.1	14.6	17.3
Smoked glass are safe for viewing the solar eclipse			
Yes	38.5(26.7, 50.3)	34.3(26.4, 42.2)	35.6(29.0, 42.2)
No	23.1	42.3	36.1
Don't know	38.5	23.4	28.2
N	65	137	202

A high awareness 83.2% to the harmful effects of viewing an eclipse was found. Surprisingly females were more knowledgeable than the males interviewed. Table-II provides the awareness of the respondents about the harmful effects of viewing an eclipse and various modes of viewing it, which they thought were safe.

The sources of information about the awareness of adverse effect of viewing solar eclipse was mainly print, electronic media & parents in both sexes. Preponderance of methods used for viewing the eclipse by women showed that most of them remained within the house during this time and that they were more aware of harmful effects of direct viewing.

Table-III provides the beliefs of respondents that the occurrence of solar eclipse has harmful effect on the unborn child or on pregnant women.

Table-IV indicates that a high percentage (63.4) was interested in viewing the solar eclipse and alarmingly 22.7% viewed it directly exposing themselves to the hazardous effect.

Table-III: Percentage distribution of beliefs of respondents (with 95% confidence interval) by sex

Characteristics	*Sex*		
	Male (% with 95% C.I.)	*Female (% with 95% C.I.)*	*Both (% with 95% C.I.)*
Believe that the occurrence of solar eclipse has a harmful effect on the unborn child			
Yes	46.2(34.1, 58.3)	52.6(44.2, 61.0)	50.5(43.6, 57.4)
No	24.6	27.0	26.2
Don't know	29.2	20.4	23.3
Believe that the occurrence of solar eclipse has a harmful effect on the pregnant women			
Yes	43.1(31.1, 55.1)	46.7(38.3, 55.1)	45.5(38.6, 52.4)
No	16.9	28.5	24.8
Don't Know	40.0	24.8	29.7
Believe that using knife or scissors at the time of solar eclipse has got an adverse effect on the unborn child			
Yes	24.6(14.1, 35.1)	48.9(40.5, 57.3)	41.1(34.3, 47.9)
No	33.8	29.2	30.7
Don't Know	41.5	21.9	28.2
Believe that using knife or scissors at the time of solar eclipse has got an adverse effect on the pregnant women			
Yes	27.7(16.8, 38.6)	43.1(34.8, 51.4)	38.1(31.4, 44.8)
No	29.2	30.7	30.2
Don't Know	43.1	26.3	31.7
N	65	137	202

Table -IV: Percentage distribution of practices of respondents (with 95% confidence interval) by sex

Characteristics	*Sex*		
	Male (% with 95% C.I.)	*Female (% with 95% C.I.)*	*Both (% with 95% C.I.)*
Did you watch the last solar eclipse?			
Yes	66.2(54.7, 77.7)	62.0(53.9, 70.1)	63.4(56.8, 70.0)
No	33.8	38.0	36.6
If yes, did you view the eclipse directly?			
Yes	25.6(15.0, 36.2)	21.2(14.4, 28.0)	22.7(16.9, 28.5)
No	74.4	78.8	77.3
N	65	137	202

DISCUSSION AND CONCLUSION

The general picture that emerges from this study is that, majority knew that viewing a solar eclipse could be harmful to their eyes but they did not know the safest way. People believe that binoculars, photographic films and sunglasses are safe for viewing solar eclipse. However, they are not safe as they do not provide adequate protection[8] and therefore should not be used. Children are at greatest risk of phototoxicity because their clear crystalline lenses may transmit some ultraviolet radiation[9], so parents should be advised to prevent their children from gazing at a solar eclipse. As there is no effective treatment for solar retinopathy, the emphasis should be on prevention. We need to increase public awareness regarding the safest way to watch an eclipse through different medias or campaigns. The Department of Health, the Royal College of Opthalmologists, and the College of Optometrists have advised not to view the sun directly[5]. The safest way to watch the eclipse is by indirect viewing using projection. This can be done by turning one's back to the sun & using a 2 mm pinhole cut in a card to project the image of the sun on to a second card a metre away. This image can be viewed safely[5]. Myths regarding ill effects of solar eclipse on pregnant mother and her fetus were quite prevalent in our study population. Therefore, these issues need to be addressed in order to remove them from our society. Family physicians and other health professionals can play a major role in providing education regarding both issues.

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