



Evaluating the Psychological Impacts of Patching Treatment on Parents in Qassim Region, Saudi Arabia

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Abstract

Edited by: Ksenija Bogoeva-Kostovska
Citation: Aljohani S, Al-Mutairi R. Evaluating the psychological impacts of patching treatment on parents in Qassim region, Saudi Arabia. *Open Access Maced J Med Sci.* 2022 Dec 20; 10(B):2648-2653. <https://doi.org/10.3889/oamjms.2022.11418>
Keywords: Amblyopia; Psychological impacts; Patching; Parents
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Received: 20-Dec-2022
Revised: 01-Dec-2022
Accepted: 20-Dec-2022
Copyright: © 2022 Saeed Aljohani, Rakan Al-Mutairi
Funding: The authors gratefully acknowledge Qassim University represented by the Deanship of Scientific Research, for the financial support for this research under the number (CAMS1-2022-1-1-J-25069) during the academic year 1444 AH/2022 AD
Competing Interests: The authors have declared that no competing interests exist
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BACKGROUND: The previous studies showed that patching treatment for amblyopia in children may have adverse psychological effects on children and families.

AIM: The aim of the study was to investigate the reliability and validity of an Arabic version of the Amblyopia Treatment Index questionnaire and to evaluate the psychosocial impacts of patching treatment on parents of amblyopic children.

METHODS: This was a cross-sectional study of 239 parents or guardians of amblyopic children who had at least five weeks of patching treatment experience in the past 6 months before enrolment. Eligible parent was either enrolled in the study from Qassim University Medical City eye clinics or referred by optometrists and ophthalmologists from 6 hospitals in Qassim province. Twenty parents were asked to repeat the same questionnaire after 14 days \pm 2 days for test-retest reliability.

RESULTS: The findings showed good internal validity and reliability for the Arabic version of the Amblyopia Treatment Index questionnaire among Saudi amblyopic patients. The factor analysis revealed that 16 of 21 items were strongly correlated through the questionnaire's internal consistency ≥ 0.5 under three factors. Seven items were strongly correlated with the factor of adverse effects of amblyopia treatment. Similarly, seven items were strongly correlated with the lack of amblyopia treatment adherence, and only two were strongly correlated with the factor of social stigma. Reliability tested by Cronbach's α coefficient showed good internal reliability and consistency (0.774). Cronbach's α coefficient for the three factors was 0.734 for adverse effect, 0.644 for lack of treatment adherence, and 0.723 for social stigma. There is no significant association between parents' education level and the final questionnaire score.

CONCLUSION: The Arabic version of the amblyopia treatment index questionnaire showed high validity and reliability for factors related to patching therapy and was useful for Saudi children. Treatment of amblyopia in the Saudi community is strongly affected by adverse effects, adherence, and social stigma of adhesive patching.

Introduction

Amblyopia is the most common cause of avoidable vision loss in children, with a prevalence of 1–4% [1], [2], [3], [4]. Amblyopia can be a unilateral or bilateral condition in which the best corrected visual acuity is $<20/20$ in the absence of any noticeable structural or pathologic anomalies but associated with either one or more of these conditions occurring before the age of 6 years; (1) interocular difference of >0.5 D spherical equivalent (SE) (anisometropia); (2) constant unilateral heterotropia at a distance and/or near; (3) amblyogenic bilateral isometropia; (4) amblyogenic unilateral or bilateral astigmatism; and (5) vision deprivation [5].

Patching and atropine penalization has been proven to be effective methods for the treatment of unilateral amblyopia in children 3–8 years old [6], [7], [8], [9]. Both treatments force the individual to use the amblyopic eye to ensure that it receives input that will support the recovery of visual function. Researchers have investigated several factors that may

contribute to amblyopia treatment failure. For example, poor adherence to the prescribed treatment due to discomfort and social stigma caused by the adhesive patching was found to be a significant factor in the failure of amblyopia treatment [10], [11]. Simultaneously, parents' level of education and socioeconomic status (SES) was found to be associated with poor adherence to patching [10]. Therefore, parents or guardians are an essential factor in amblyopia treatment success. The Pediatric Eye Disease Investigator Group (PEDIG) published a paper with the results of a questionnaire administered to assess the parental quality of life during amblyopia treatment [12]. The questionnaire assessed adverse effects, adherence, and social stigma associated with either patching or atropine treatment. Results from the study indicated that the patching group had higher (worse) scores of parental quality of life among all three subscales scores of the questionnaire (overall mean, 2.52 vs. 2.02, $p < 0.001$). The psychosocial impacts of patching treatment on parents were higher than atropine treatment [12], [13].

The Amblyopia Treatment Index (ATI) was developed to assess children's and parents' quality of life

during amblyopia treatment [14]. No such questionnaire in the Arabic language can be used to evaluate the psychosocial impacts of patching treatment on Arabic-speaking parents of amblyopic children. Therefore, this study investigates the validity and reliability of an Arabic version of the ATI questionnaire to assess parents of amblyopic children's quality of life during patching therapy. In addition, a potential relationship between parents' level of education and the questionnaire scores is investigated.

Materials and Methods

The research protocol and informed consent for this study were approved by Qassim University Institutional Review Board. This research was conducted following The Code of Ethics of the World Medical Association, and parents or guardians of amblyopic children were provided written informed consent before participation.

Translation into Arabic language process

Nineteen questions were the components of the original ATI questionnaire created by the PEDIG research group and are available on the PEDIG public website [15]. The questionnaire consisted of a brief instructions page and 22 Likert questions, with five responses extending from "strongly agree" to "strongly disagree." An additional choice, "not applicable," is added to two components of question #6. The scores range from 5 to 1, with a higher score indicating a higher negative impact or burden. Conversely, questions 1, 9, and 15 were positive statements, and their scores were inverted. The original ATI questionnaire was translated into Arabic by two authors and was sent to three faculty members in the department of optometry at Qassim University for face validity. Based on their comments, a revised questionnaire was completed and sent back to the committee for a second review. After the approval was obtained from the three committee members, the questionnaire was sent to an English professor (native Arabic speaker) at Qassim University who was not aware of the original ATI questionnaire for back translation from Arabic into English. A few discrepancies between the translated and the original ATI questionnaires were found and improved. One question about the highest educational level of the parent or guardian was added to the Arabic version to investigate its potential relationship with the ATI score. After all, the final Arabic version was produced.

Study protocol

This was a cross-sectional study of 240 parents or guardians (referred to as parents hereafter)

conducted at Qassim University medical city. Eligible parent was either enrolled in the study from Qassim University medical city eye clinics or referred by optometrists and ophthalmologists from six hospitals in Qassim province. Before completing the questionnaire, parents were given written informed consent. They were instructed to answer the questions carefully and comfortably and ask any questions related to the questionnaire or the study. Eligibility criteria were as follows: (1) Parents of amblyopic children 3 to 12 years old; (2) children with unilateral amblyopia associated with anisometropia and/or strabismus; (3) visual acuity of the amblyopic eye between 20/40 and 20/100 inclusive; (4) interocular difference in visual acuity of $> 2 \log$ Mar lines; (5) undergo or undergoing patching for a minimum of 5 weeks in the past 6 months before participation in the study; and (6) parent who go with the child to the follow-up visit at the time of referral.

Completed questionnaires were checked regularly for possible missing responses by one author (RA). Twenty parents were asked to complete the same questionnaire after 14 days \pm 2 days for test-retest reliability. A printed QR code that opens the questionnaire electronically was provided after their first visit to facilitate their second participation. A reminder to complete the second response was sent through WhatsApp application.

Statistical analysis

Questionnaires missing two or more responses were excluded from the analysis. The validity and reliability of the Arabic version of the ATI questionnaire were investigated. Factor analysis was used to examine internal validity (the correlation between the questionnaire items and the underlying factors identified previously for the original ATI questionnaire. The underlying factors that the Arabic version was built on were: (1) Side effects of the treatments; (2) adherence to the treatment; and (3) social stigma of the treatment. A correlation between items in the questionnaire and the underlying factors ≥ 0.5 was considered satisfying. Factors that did not load strongly on any factor loaded equally on different factors, or after their removal, increasing internal consistency was noticed, were excluded from the final factor analysis [12], [16].

Test-retest reliability was assessed by calculating the intra-class correlation coefficient using two responses from 20 participants (a total of 40 responses). Furthermore, to estimate the internal consistency of the questionnaire, Cronbach's alpha was computed. A good value for internal consistency was expected to be between 0.6 and 0.8 and excellent if ≥ 0.8 .

The Chi-square t-test was used to investigate the correlation between the highest educational level of parents and the overall score of the questionnaire. Data were collected in Excel (Microsoft Corporation, USA), and statistical analysis was performed using the SPSS

software package (IBM SPSS Statistics for Windows, Version 22.0. Armonk, NY: IBM Corp., USA). Statistical significance was set at <0.05 .

Results

The questionnaire was completed by 239 participants at Qassim University Medical City. The distribution of respondents who were responsible for putting and keeping the patch on children for the treatment of amblyopia was as follows: The majorities, 208 (87%), were mothers, 23 (9.6%) were fathers, and only 8 (3.3%) were another guardian. Approximately 96 (40.2%) of respondents reported that they were responsible for applying the eye patch most of the time, followed by 60 (25.1%) respondents responsible for keeping the patch all the time. Conversely, almost 42 (17.6%) and 41 (17.2%) of respondents were responsible for treatment half of the time and less than half of the time, respectively. Regarding the education level of the participants, most of them, 153 (56.5%), had bachelor's degrees, and only 17 (7.1%) had basic education less than high school. Therefore, most participants have a good idea and understanding of the questionnaire and their items. They completed it at the hospital with some assistance from eye care providers, as shown in Table 1.

Table 1: Characteristics of the participants

Characteristics of the respondents	Years (%)
Age of the children	Mean: 6.86 SD: 2.21 Minimum: 3.00 Maximum: 12.00
The person responsible for putting the patch	Mother: 208 (87.0) Father: 23 (9.6) Other: 8 (3.3)
Educational levels	Bachelor's degree: 135 (56.5) High school: 46 (19.2) Diploma after high school: 27 (11.3) Basic education less than high school: 17 (7.1) Postgraduate education: 14 (5.9)

The frequency and percentage table were used to show the response distribution to assess whether any items have a specific range. The analysis was performed for the items responded to by the parents or other persons responsible for applying the patching for the treatment of amblyopia. The participants completed 22 questions designed by the PEDIG group to assess the three factors; adverse effect, lack of adherence, and social stigma that could affect the amblyopia treatment using patching therapy. However, any questionnaire missing essential information was excluded from the final analysis (Table 2).

Internal reliability

Reliability is the extent to which a questionnaire or any measurement method produces the same results on repeated procedures. Alternatively, it means

the stability of scores across the respondents, thus reliability checking the participants' responses. In this study, the internal reliability of the Arabic version of the ATI questionnaire was 0.774 for three factors; adverse effect, lack of treatment adherence, and social stigma, which included 21 items. This value showed its good internal reliability and consistency. Cronbach's α coefficient for the three factors was 0.734 for adverse effect, 0.644 for lack of treatment adherence, and 0.723 for social stigma.

Validity

An expert group of pediatric eye care examined the content validity of the questionnaire and the construct validity of the questionnaire was performed by Bivariate analysis, as shown in Table 3. The analysis revealed that 16 of 21 items were strongly correlated through the questionnaire's internal consistency equal to or greater than 0.5 under three factors, adverse effect, lack of amblyopia treatment adherence, and social stigma related to amblyopia treatment. In our study, seven items were strongly correlated with the adverse effects of patching treatment, seven were strongly correlated with the subscale of lack of amblyopia treatment adherence, and only two were strongly correlated with the section on social stigma.

Education level of parents and the final ATI questionnaire score

The association between parents' education level and the final questionnaire score was statistically not significant $p = 0.260$, as shown in Table 4.

Discussion

Occluding the non-amblyopic eye is the most common method for treating unilateral amblyopia; the technique is mainly based on forcing the amblyopic eye to function. Patching treatment in young children may have adverse psychological and emotional effects on children and families. Thus, the present study was conducted to evaluate the psychological impacts of patching treatment on parents in the Qassim region, Saudi Arabia, using the Amblyopia Treatment Index (ATI) questionnaire. After the translation of ATI to the Arabic language, the reliability and validity of the Arabic version of amblyopia treatment, specifically for amblyopic children treated with eye patching, was assessed in the current study. Our findings indicate that the Saudi version of the ATI questionnaire showed good validity and reliability for factors related to amblyopia treatment and was useful for Saudi children. Moreover, patching treatment in the Saudi community is strongly

Table 2: Distribution response for the items of the amblyopia treatment index questionnaire (n=239)

Questions	Strongly agree (5) n (%)	Agree (4) n (%)	No idea (3) n (%)	Disagree (2) n (%)	Strongly disagree (1) n (%)	Mean (1–5)
1. The child does not seem to mind wearing the eye patch	35 (14.6)	99 (41.4)	48 (20.1)	48 (20.1)	9 (3.8)	3.43 ± 1.08
2. Worry that my child misses out on fun activities due to wearing a patch	22 (9.2)	69 (28.9)	55 (23)	77 (32.2)	16 (6.7)	3.02 ± 1.12
3. Wearing patch affects my child's learning	20 (8.4)	67 (28)	51 (21.3)	88 (36.8)	13 (5.4)	2.97 ± 1.10
4. Wearing a patch makes it hard for my child to play outside	34 (14.2)	94 (39.3)	40 (16.7)	63 (26.4)	9 (3.3)	3.35 ± 1.12
5. I have trouble putting on the patch for my child	25 (10.5)	83 (34.7)	65 (26.8)	58 (24.3)	9 (3.8)	3.24 ± 1.05
6. (a). Wearing a patch is a source of tension or conflict for a child	20 (8.4)	72 (30.1)	49 (20.5)	85 (35.6)	13 (5.4)	3.00 ± 1.10
6. (b). Wearing patches is a source of tension or conflict with other family members	9 (3.8)	49 (20.5)	42 (17.6)	106 (44.4)	33 (13.8)	2.56 ± 1.10
6. (c) Wearing patch is a source of tension or conflict with babysitter or teachers	10 (4.2)	36 (15.1)	59 (24.7)	103 (43.1)	31 (13.0)	2.54 ± 1.03
7. Wearing a patch makes it difficult for my child to draw, color, or write	16 (6.7)	66 (27.6)	70 (29.3)	72 (30.1)	15 (6.3)	2.98 ± 1.04
8. I worry that the patch will cause my child to become injured	25 (10.5)	83 (34.7)	55 (23.0)	59 (24.7)	17 (7.1)	3.17 ± 1.13
9. My child can see well when wearing the patch	25 (10.5)	85 (35.6)	69 (28.9)	55 (23.0)	5 (2.1)	3.28 ± 1.00
10. My child complains when it is time to wear the patch	41 (17.2)	111 (46.4)	37 (15.5)	43 (18)	7 (2.9)	3.57 ± 1.06
11. Wearing a patch makes my child's eyes or eyelids red or irritated	30 (12.6)	55 (23.0)	53 (22.2)	79 (33.1)	22 (9.2)	2.97 ± 1.20
12. I worry that my child does not wear the patch enough	28 (11.7)	119 (49.8)	48 (20.1)	37 (15.5)	7 (2.9)	3.52 ± 1.00
13. My child is clumsy while wearing the patch	15 (6.3)	72 (30.1)	68 (28.5)	71 (29.7)	13 (5.4)	3.02 ± 1.03
14. Other children stare at my child	93 (38.9)	114 (47.7)	31 (13.0)	1 (0.4)	0 (0.00)	4.25 ± 0.70
15. I believe wearing the patch will improve my child's vision	105 (43.9)	76 (31.8)	43 (18.0)	12 (5.0)	3 (1.3)	4.12 ± 0.96
16. The patch makes it difficult for my child to play	10 (4.2)	61 (25.5)	72 (30.1)	85 (35.6)	11 (4.6)	2.89 ± 0.98
17. I sometimes forget to put the patch on my child	21 (8.8)	85 (35.6)	53 (22.2)	68 (28.5)	12 (5)	3.15 ± 1.10
18. I worry that wearing the patch makes my child feels different	44 (18.4)	105 (43.9)	43 (18)	36 (15.1)	11 (4.6)	3.59 ± 1.10
19. I have trouble keeping a patch on my child	31 (13.0)	78 (32.6)	62 (25.9)	59 (24.7)	9 (3.8)	3.26 ± 1.10

Table 3: Correlation between items and factors from factor analysis for three respondents

Items retained for factor analysis	The adverse effect of treatment	Treatment adherence	Social stigma
Items related to the adverse effect of amblyopia treatment			
Q2. My child misses out on fun activities due to wearing a patch	0.50	0.34	0.08
Q3. Wearing patch affects my child's learning	0.58	0.14	0.20
Q4. Wearing a patch makes it hard for my child to play outside	0.53	-0.02	0.40
Q7. Wearing a patch makes it difficult for my child to draw or write	0.57	0.17	0.11
Q8. I worry that the patch will cause my child to become injured	0.55	0.09	0.32
Q9. My child can see well when wearing the patch	0.15	0.02	0.21
Q13. My child is clumsy while wearing the patch	0.54	0.13	0.05
Q15. I believe wearing the patch will improve my child's vision	0.02	-0.12	0.16
Q16. Wearing a patch makes it difficult for my child to play	0.60	0.11	-0.02
Items related to lack of treatment adherence			
Q1. The child does not seem to mind wearing the eye patch	-0.02	0.02	-0.12
Q5. I have trouble putting on the patch for my child	0.11	0.50	0.14
Q6A. wearing patch is a source of tension or conflict with the child	0.24	0.60	0.15
Q10. My child complains when it is time to wear the patch	0.10	0.50	0.13
Q12. I worry that my child does not wear the patch enough	0.07	0.52	0.20
Q19. I have trouble keeping a patch on my child	0.03	0.50	0.14
Q17. I sometimes forget to put the patch on my child	0.21	0.50	0.21
Q6B. Wearing patches is a source of tension or conflict with other family members	-0.07	0.50	0.15
Q6C. Wearing patches is a source of tension with babysitters or teachers	0.08	0.40	0.01
Items related to social stigma			
Q11. Wearing a patch makes my child's eyes or eyelids red or irritated	0.04	0.29	0.50
Q14. Other children stare at my child	-0.03	0.02	0.12
Q18. I worry that wearing the patch makes my child feels different	0.12	0.15	0.50

*Estimated factor loading >0.5 are in bold. Items 1, 6c, 9, and 14, 15 did not load strongly, with a poor correlation of <0.5.

Table 4: The association between the education level of parents and the final ATI questionnaire score

Chi-square tests	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-square	191.793 ^a	180	0.260
Likelihood Ratio	180.785	180	0.470
Linear-by-Linear association	0.374	1	0.541
No. of valid cases	239		

^a220 cells (95.7%) have an expected count of <5. The minimum expected count is 0.06.

affected by adverse effects, adherence, and social stigma of wearing adhesive patches.

This study showed good internal reliability and consistency of the Arabic version of 21 items covering three factors, adverse effect of treatment, lack of amblyopia treatment adherence, and social stigma, where Cronbach's α coefficient was 0.774. This is comparable to that shown from the Chinese version, which suggested good internal reliability for 21 items where Cronbach's α coefficient was 0.768 [17].

In our study, seven items were strongly correlated with the adverse effect of amblyopia treatment; seven items were loaded greater than 0.5 with a factor

of lack of treatment adherence, and two items were significantly correlated with the social stigma. This is similar to the previous studies [12], [17], [18] that used the ATI questionnaire to assess the psychological effect of patching on children and families, indicating that the three factors mentioned above were common among the community. However, these effects are anticipated to happen after a while of amblyopia treatment. The ATI study showed that the initial month of treatment was tolerated by parents and children [14].

To raise awareness, psychological impacts associated with patching treatment may result in unsuccessful treatment if not evaluated. A study conducted in the Qassim region of Saudi Arabia showed that the mean age of diagnosing children with amblyopia was 9 years [19]. This delay in the diagnosis and treatment of childhood amblyopia could be due to a lack of awareness and the psychological effects of amblyopia treatment, as revealed in this study.

Using the QR codes to complete the second response by the first 20 participants was a limitation in

this study. There was a slight confusion in matching the second response with the first response. As a result, we had to contact all 20 participants to document the time and date of completing the second response. Unfortunately, information is scarce regarding amblyopia treatment in the Saudi community in the literature. Therefore, further investigation of different aspects of amblyopia treatment is crucial for long-term public health.

Conclusion

The Arabic version of the amblyopia treatment index questionnaire showed high validity and reliability for factors related to patching therapy and was useful for Saudi children. Treatment of amblyopia in the Saudi community is strongly affected by adverse effects, adherence, and social stigma of adhesive patching.

Disclosure

The authors report no conflicts of interest in this work and declare that they have no financial or personal relationships that may have inappropriately influenced them in writing this article.

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