RESEARCH ARTICLE

Conceptual Development of Paediatric Vision Questionnaire for Opportunistic Screening in Optometry and Ophthalmology Clinics

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Abstract:

Vision screening in children advocates preventive eye health care. Current paediatric vision screening programs have limitations due to the type of test used, inter-examiner variation, and reliability of physical testing responses that affect the accuracy of vision testing. This study aims to report the development and conceptual framework of a new questionnaire-based complementary paediatric vision screening technique. A multi-perspective development strategy was employed to integrate viewpoints from stakeholders in crafting the minimalism notion. The process of the development included item generation, item construct analysis, and conceptual model depiction. Proxy-reporting paediatric eye screening questionnaire (PRePESQ) contains four unique features: short (< ten minutes); simple (two-tier system of screening-probing layers with wording-image in answer options); wide-ranging eye screening (ocular health, physical, physiological, and perceptual vision); all-inclusive paediatric age range (from new-born to adolescent). PRePESQ is designed as a complementary paediatric vision screening adjunct to equipment-based vision screening when the apparatus required for practical paediatric vision screening is inadequate. Nurses or clinic assistants can administer at optometry and ophthalmology clinics with the assistance of primary caretakers to screen for vision disorders. Besides keeping consistency across individuals for paediatric vision screening, it also saves time and cost.

Keywords: ophthalmology, optometry, paediatric vision, questionnaire, vision screening

1. INTRODUCTION

Vision screening in children advocates preventive eye health care and impacts the quality of life in children (Stoll, Speeg-Schatz, & Sauer, 2019). Yet, inconsistencies in what constitutes an appropriate paediatric vision screening method persist (Metsing, Jacobs, & Hansraj, 2018). Disagreement continues about the appropriate age at which should be screened and who should conduct the screening (Honavar, 2018). Current paediatric vision screening programs have limitations due to the type of test used, inter-examiner variation, and reliability of physical testing responses that affect the accuracy of vision testing (Chen, Abu Bakar, & Arthur, 2019; Marmamula et al., 2018). The implementation of equipment-based paediatric vision screening programs was diverse within countries preceded by limited resource issues (Chen et al., 2019). Most focused on reduced visual acuity. Overemphasis on one aspect of vision may cause other components left untreated and affect the complete ability to perform visual related activities. With the implementation practicality challenge of tool-based vision screening program due to time-cost-labour constraint, utilising questionnaires as paediatric vision screening has its potential (Chen et al., 2019). Shortage of professional eye care practitioners, the coverage of target conditions, and cost issues implicit the need to engage alternative options. No single questionnaire to screen for wide-ranging vision disorders is currently available (Chen et al., 2019; V Tadić & Rahi, 2017). Current questionnaires are primarily designed for specific conditions for certain purposes, target conditions, and target populations (V Tadić, Hogan, Sobti, Knowles, & Rahi, 2013). Most private optometry practices in Malaysia have basic optometry instruments to conduct visual acuity and refraction for adults (Abd Aziz, Mafakhir, Badarudin, & Muhammad Sharif, 2020). The majority do not practise speciality services such as advanced optometry procedures and paediatric eye examination due to time-equipment cost-labour factors (Abd Aziz et al., 2020). The purpose of this article is to report the development and conceptual framework of a new questionnaire-based complementary paediatric vision screening technique for opportunistic screening administered by nurses or clinic assistants in the optometry and ophthalmology clinics, named proxy-reporting paediatric eye screening questionnaire (PRePESQ).

2. MATERIALS AND METHODS

This study design of questionnaire development adhered to the Declaration of Helsinki. Ethical approval was attained from the institutional review board (Ref: 600-IRMI (5/1/6) REC/85/17). Informed consent was obtained before participation, conforming to the ethics requirement. The value proposition was first done to map out the critical aspects of the questionnaire as the product to define the questionnaire design idea. Minimalism notion that covers wide-ranging vision disorders and all-inclusive of the paediatric population was the essence that set the direction for developing this questionnaire. A multi-perspective development strategy was employed to integrate stakeholders' perspectives involving eye care professionals and end-users through focus groups and user research (Tausch & Menold, 2016). The process of the development included item generation, preliminary item construct analysis, and conceptual model depiction.

Development of Proxy-Reporting Paediatric Eye Screening Questionnaire (PRePESQ):

Step 1: Item Generation

We engaged in a simple working backward tactic to add clarity and definition to the questionnaire idea (Cross, 2004). We started with target users in mind and worked our way back to obtain the minimum set of requirements to fulfil what it intended to accomplish. This approach was particularly imperative when developing a new product with new features. General child development is usually discussed in term of six stages of child development encompassing new-born (ages 0 - 4 weeks); infant (ages 4 weeks - 1 year); toddler (ages 12 months - 24 months); pre-schoolers (ages 2 - 5 years); school-aged child (ages 6 - 12 years); adolescent (ages 13 - 19 years) (Smith, Cowie, & Blades, 2015). Our target paediatric population included new-born, infants, toddlers, pre-schooler, school-aged children, and adolescents. Proxy-reporting was chosen over self-reporting to standardise the administration mode due to the cognitive and physical limitations in the younger paediatric population. Another important set of the minimum requirement was to define the scopes of vision screening to ensure wide-ranging coverage of vision disorders. Four vision clusters (physical, physiological, perceptual, and ocular health) were delineated according to the current practice of eye care practitioners. The physical vision cluster emphasises the visual ability of the optical visual system when light enters the eye, covering spatial, temporal, and spectral acuities. This physical vision cluster is closely linked to the manifestation of blurriness that requires spectacle or contact lens correction. Optometrists and opticians usually play substantial roles in this cluster. Physiological vision cluster refers to the ocular alignments, visual comfort, and coordination of the two eyes, including focusing system, vergence system, and eye movements. Any detected problems often require optical aids modification, visual therapy, eye muscle corrective surgery, and multidisciplinary management by optometrists, orthoptists, and ophthalmologists. Perceptual vision cluster is related to the visual information process that extracts and organises information from the surroundings. For the paediatric population, it is usually linked to visual learning skills such as visual figure-ground, visual discrimination, visual position in space, visual memory, visual-motor integration, visual closure, and form constancy, etc. The developmental or behavioural optometrists or visual development therapists have contributed to this cluster and work closely with educationists, clinical psychologists, and other learning-related health disciplines in screening, diagnosis, and management. The ocular health cluster covers any ocular diseases from anterior to posterior segments of the eyes. The ideal eye health care pathway holds optometrists to undertake primary eye care roles to screen for abnormalities before referring to ophthalmologists for speciality secondary and tertiary intervention. Featuring this classification in the design plan facilitates the referral and follow up with respective eye care professionals after paediatric vision screening. To find suitable initial items for four vision clusters in PRePESQ development, Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) was employed to comb for published paediatric eye care questionnaires using Boolean operators, truncation, wildcard, and phrase search strategy in Scopus, PubMed, and EBSCO host MEDLINE Complete database. A combination of database-specific terms and keywords searched were used. Target population was children aged from birth to 17 years and 11 months old. The keywords used were including “child*, pediatr*, infant, and toddler”. Keyword “vision” was used for to cover a broader range of target vision problems. The general keyword of “screening” was used to cover a wider range of of screening.

Step 2: Item Construct

The extracted items were then matched to four vision clusters by optometrists. Optometrists were recruited due to the relevance of their job scopes that encompassed all four vision clusters. Optometrists are recognised by the World Council of Optometry, the official optometric organisation that is linked to the World Health Organization's roles as primary eye care practitioners. As primary eye care practitioners, they are at the frontline and play an imperative role in eye health screening. The initial invitation was sent out to twenty optometrists, but only nine agreed to participate. Their working experience ranged from 4 to 15 years. Seven of the optometrists worked at private practices and two of the optometrists worked at tertiary education institutions. Each optometrist was briefed in a separate room before a list of 364 items was presented on a printed sheet. Each optometrist was required to match every item in the list to respective principal vision clusters based on perceived relevance. Each optometrist was requested to indicate 'relevant' or 'not relevant' for every item of vision cluster in the recording sheet provided. Every item was allowed to relate to more than one vision cluster if reckoned as relevant.

In the item construct quest, the viability of using images as answer options was also inspected. The user research approach was applied. Pre-defined characteristics of drawings were first produced with the target user in mind. Three sets with six common collections were recognised from the repetition of the extracted items to test the images as answer options (Table 1). A total of 16 drawings was constructed based on respective pre-defined characteristics by the teamwork of two optometrists (with 20 and 25 years of working experience, respectively) and a professional artist. One of them has been a Fellow of the College of Optometrists in Vision Development since 2003. All drawings were compiled into random sequences in a PowerPoint presentation and presented using a desktop screen at a viewing distance of 40 cm. Thirty parents with children below 18 years old were instructed to describe each drawing verbally during the test. With a sample size of 30 in this pilot test, there was a 95% chance that the real value was within ±16.40% of the measured value. The fixation pattern was recorded using eye-tracking technology (Dikablis Professional Eye Tracking). Completion time was recorded using a stopwatch, and cognitive debriefing was performed. Cognitive debriefing was carried out to determine if they understand the questionnaire the same as the original intended to be understood.

Table 1. Sets and collections to formulate pre-defined characteristics for drawings

Sets	Collections	Pre-defined characteristics for picture selection
Signs	General eye appearance	
	• Tearing	• The appearance of an overflow of tears
	• Redness	• The appearance of redness in the eye
	• Eye discharge	• The appearance of secretion from the eyes other than tears
	• Swollen	• The appearance of increased size in the eye
	• Deviation	• The appearance of deviating eyes
	Interaction with the eye	
	• Rub	• The action of hand pressing and moving around the eyes
Symptoms	Visual experience	
	• Double vision	• An object is seen as double
	• Headache/ dizzy	• Expression of pain at the head
	• Eye pain	• Expression of pain at the eye
	• Lose concentration	• Expression of no interest
Visual related activities	Interaction with far object	
	• Watch TV	• The action of difficulties in watching TV
	• Read or copy from the board	• The action of difficulties in seeing the board in class
	Interaction with near object	
	• Reading or Computer	• The action of view object at close distance
	• Writing	• The action of writing a sentence up/downhill direction and not conform to a straight line
	Interaction with surrounding	
	• Mobility & navigation	• The action of bumping into something
	• Reaction to light	• The action of partly cover eyes to see clearly

Step 3: Conceptual Framework

The content and criterion were verified to develop the conceptual model of PRePESQ. The key characteristics in the conceptual model development of the PRePESQ included simple, practical, wide-ranging vision disorders, all-inclusive of the paediatric population, and for screening purposes only. This report only covered the development process and did not cover the field tests on the reliability of the questionnaire using person and item reliability estimates, outfit and infit measures, and a person-item map.

3. RESULTS AND DISCUSSION

Five thousand three hundred ninety-eight articles were retrieved initially from the Scopus, PubMed, and EBSCO host MEDLINE Complete database. After removal of duplication and filtering process with pre-determined criteria [literature type – journal only, language – English only, timeline (2005-2019), relevance to paediatric eye care], a list of 364 items were extracted from 30 articles describing 26 validated paediatric eye care questionnaires (Abu Bakar, Ai Hong, & Pik Pin, 2012; Angeles-Han et al., 2010; Birch, Cheng, & Felius, 2007; Bokhary, Suttle, Alotaibi, Stapleton, & Boon, 2013; Borsting, Rouse, & De Land, 1999; Carlton, 2013; G. Cochrane, Lamoureux, & Keeffe, 2008; G. M. Cochrane, Marella, Keeffe, & Lamoureux, 2011; Cole et al., 2001; Crescioni et al., 2014; Felius et al., 2004; García-Ormaechea, González, Duplá, Andres, & Pueyo, 2014; Gothwal, Lovie-Kitchin, & Nutheti, 2003; Gothwal, Sumalini, Bharani, Reddy, & Bagga, 2012; Hatt et al., 2010; Holmes, Leske, Cole, Chandler, & Repka, 2006; Holmes et al., 2008; Houliston, Taguri, Dutton, Hajivassiliou, & Young, 1999; Hrisos, Clarke, & Wright, 2004; Juniper, Howland, Roberts, Thompson, & King, 1998; Khadka, Ryan, Margrain, Court, & Woodhouse, 2010; Mcculloch et al., 2007; Pueyo et al., 2014; Rahi, Tadi, Keeley, & Lewando-Hundt, 2011; Rouse et al., 2009; Sabri, Knapp, Thompson, & Gottlob, 2006; Sacchetti et al., 2007; Souza, Alexandre, & Guirardello, 2017; V Tadić, Cooper, Cumberland, Lewando-Hundt, & Rahi, 2013; Valerija Tadić et al., 2016; Vaughn, Maples, & Hoenes, 2006).

The 364 items generated from the literature search were sorted based on their relevance to respective vision clusters. Approximately 90% of the items were linked to more than one vision cluster based on expert opinions (Table 2). These findings inferred the ambiguity of the content and construct in those items extracted from the literature review of paediatric eye care questionnaires. Contributing factors included ambiguous words, a vague question with many possible answers, more than one focus in a single sentence, and items with activities that involved more than one vision function. Careful selection of item constructs is essential to establish a well-defined link of items to explicit ocular conditions. Due to the ambiguity of the literature generated items and only a small number of items (11%) were connected to one single vision cluster, construction of new items was indispensable.

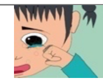
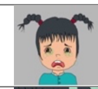
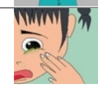
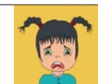
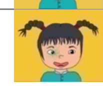
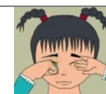
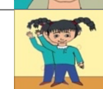
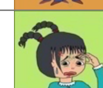
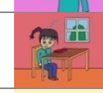
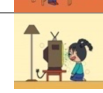
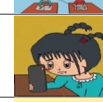
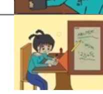
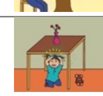
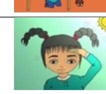
Table 2. The percentages of items associated with principal vision clusters are sorted based on expert opinions

Code	Group 0	Group 1	Group 2	Group 3	Group 4
ECP1	6%	30%	39%	23%	2%
ECP2	0%	2%	22%	32%	44%
ECP3	7%	42%	38%	12%	1%
ECP4	15%	51%	30%	4%	0%
ECP5	0%	0%	0%	19%	81%
ECP6	6%	12%	54%	24%	4%
ECP7	0%	0%	4%	23%	73%
ECP8	65%	24%	8%	2%	1%
ECP9	1%	20%	47%	29%	3%
Average	11%	20%	27%	19%	23%

Footnotes::
ECP - Eye Care Practitioner
Group 0 - Items that were related to none of the vision clusters
Group 1 - Items that were related to only one vision cluster
Group 2 - Items that were related to two vision clusters
Group 3 - Items that were related to three vision clusters
Group 4 - Items that were related to four vision clusters

The simplicity approach advocated by the conceptual model prompted an additional investigation to study the viability of using images as answer options. The findings for 16 drawings are summarised in Table 3. Half of the 16 drawings have more than 80% correct verbal responses or descriptions that matched the characteristics and target conditions. The completion time for each drawing ranges from 2.5 to 5 seconds. Much faster than the average response time of one minute per item construct using wordings in the questionnaire (Gagliardi et al., 2019; Souza et al., 2017). The 16 drawings' subjective verbal feedback was transcribed to unravel the probable explanation of low accuracies in particular drawings. Drawing for watery eye and eye itchiness were easily mistaken for crying. Blur vision and visual-motor coordination were overlooked or missed due to unwanted distractions added to complete the room space in the drawings. Drawing for concentration was confused with lethargic or other physical fatigue concerns. Difficulty with near visual task drawing was the most difficult to comprehend due to various ambiguities. The picture of glare was misguided as looking far to search for someone or something. Time to complete per item and match description support the usage of visual touch in answer options. Cognitive debriefing was also carried out regarding the clarity and relevance of 16 items. Images for the PRePESQ development were reconstructed according to the analysis of the fixation pattern and cognitive debriefing. The decision was made based on practicality and feasibility to adopt drawings as answer options in the ocular health cluster to overcome the language hurdle of a complex expression.

Table 3. The percentage of match description and completion time for 16 drawings.

Target ocular conditions	Drawing [a]	Percentage of a match (%)[b]	Time to complete (seconds) [c]
Watery eye		73.3	2.72±0.78
Red-eye		83.3	2.63±0.62
Eye discharge		80.0	3.46±1.25
Swollen eye		93.3	3.64±2.16
Squint		100.0	2.98±1.39
Itchy eye		70.0	2.75±1.07
Double vision		80.0	4.59±2.31
Headache		86.7	2.70±1.05
Eye pain		86.7	3.53±1.23
Concentration		66.7	2.97±0.97
Blur at distance		73.3	2.84±1.09
Blur at distance		73.3	3.07±1.25
Near visual task problem		53.3	4.24±3.05
Visual-motor coordination		76.7	3.79±1.68
Visual mobility problem		96.7	2.63±1.03
Glare		56.7	3.36±1.08

Footnotes:
[a] Drawings that were presented to participants. Circles in the drawings displayed the fixation pattern of participants
[b] Percentage of participants with correct descriptions as pre-defined characteristics or correct target ocular conditions
[c] Average time to complete the item in mean and standard deviation in seconds
Vision cluster 1: blur at distance, near visual task problem, glare
Vision cluster 2: squint, itchy eye, double vision, headache, eye pain
Vision cluster 3: concentration, visual-motor coordination, visual mobility problem
Vision cluster 4: watery eye, red-eye, eye discharge, swollen eye

The preliminary questionnaire was piloted using a user research approach. The time to complete ranged from 4.8 minutes to 9 minutes. They observed the general rule of thumb for standard questionnaire design to keep the completion time below 10 minutes (Burchell & Marsh, 1992; Herzog & Backman, 1981). In the cognitive debriefing exercise, participants were requested to comment on every item regarding clarity and relevance to respective vision clusters, its importance to the targeted ocular conditions, and if rewording could improve the item. Only minor corrections were noted for item constructs in all four vision clusters. However, the personal detail section required a significant revision to eliminate the confusion due to ambiguity to fill up details between the primary caretaker and the targeted paediatric population.

In developing the PRePESQ, it is essential to ensure the legitimacy of construct, content, and criterion (Boparai, Singh, & Kathuria, 2018). A suitable construct measures what it is intended to measure. Good content represents what it aims to measure. Items that correspond to the same target ocular condition represent the same criterion. Align with the minimalist approach conceptual model in PRePESQ design; the paediatric population was simplified into three age groups newborn-infant, toddler-pre-schooler, school child-adolescent in the PRePESQ development. The simplification was based on the similarity in mobility and visual learning environments.

As a newly developed proxy-reporting paediatric eye care questionnaire, PRePESQ contains four unique features. Firstly, PRePESQ is easy and fast to be used. The total average duration to complete is below 10 minutes. Secondly, it employs a simple two-tier system approach that comprises of screening layer and probing layer. It integrates wording-image in answer options. Thirdly, PRePESQ aims for wide-ranging eye screening. It covers four vision clusters of physical, physiological, perceptual, and ocular health. Finally, PRePESQ adopts an all-inclusive 3-in-1 compendium design. It contains three versions to cover a broad paediatric age range: newborn-infant version, toddler-pre-schooler version, and school-adolescent version.

The content and criterion were verified to develop the two-tier conceptual model of PRePESQ that led to the differentiation between screening items and their respective probing items. The conceptual model observed the standard recommendation on the length of the questionnaire and item structures (Burchell & Marsh, 1992; Herzog & Backman, 1981). A simple 'two-tier system' approach was embraced. Tier-One is designed to quickly screen main vision concerns in four vision clusters using one simple closed-ended question for each with minimum wording. For those with no eye problems, the screening ends after they answer screening questions in Tier-One. If failing any Tier-One screening in any vision cluster, one proceeds to Tier-Two probing items. There are three possibilities for Tier-Two screening outcomes. The first possible outcome is all answers are negative, so this nullifies the Tier-One. Those who fall under this category are marked as 'pass'. The second possible outcome is Tier-Two screening with a total of more than three answers of 'not sure' & 'I don't know' that indicates high uncertainty of the proxy-reporting. Those who fall under this category are marked as 'borderline'. The third possible outcome is Tier-Two screening confirms specific eye problems. The affected vision cluster is identified to assist relevant referral. Those who fall under this category are marked as 'fail'. The two-tier approach is adopted by contemplating on time-labour-cost factors that shackle the implementation of most paediatric vision screening programs. A simple two-tier system comprises of screening layer and probing layer. Tier-One is for quick screening using one simple closed-end question for each vision cluster with minimum wording. This simplicity encourages participation and saves time, cost, and labour to optimise paediatric vision screening outcomes. Keeping the questionnaire short is crucial because fatigue leads to data inaccuracy (Burchell & Marsh, 1992; Herzog & Backman, 1981).

For most questionnaire designs, a general rule of thumb is best to keep the completion time below 10 minutes. Our study on the completion time of PRePESQ is well below 10 minutes. Shorter sentences are easier to understand (Burchell & Marsh, 1992; Herzog & Backman, 1981). It has been reported that sentences with eight words or less are easy to read, while 21 words are relatively difficult to read and more than 25 words are challenging to read (Burchell & Marsh, 1992; Herzog & Backman, 1981). The maximum wordings of all item constructs in PRePESQ is 18 words. It is well within the recommendation. The effect of sentence length also varies with age (Burchell & Marsh, 1992; Herzog & Backman, 1981). Preferably short sentence length for the younger age group. Sentences shorter than 15 words can be processed in the working memory at the first reading, while sentences longer than 15 words exceed the working memory capacity and reduce the level of text comprehension (Mikk, 2008). The majority of items in PRePESQ are well below ten words.

PRePESQ employs a closed-ended questions approach with pre-coded responses and neutral opinion options. The question approach engages better with the mind than the statement approach (Hagtvedt, 2015). Question style is more suitable for proxy-reporting questionnaire surveys and is usually associated with calm conditions (Hagtvedt, 2015). PRePESQ adopts a mix of neutral and negative phrasings with easy adjectives in designing the items. PRePESQ integrates signs, symptoms, and pictorial options with visual-related activities in its new item constructs. By explicitly offering neutral or no opinion options, we want to reassure caretakers that it is alright to be unsure (Jon A. Krosnick et al., 2002; McClendon & Alwin, 1993).

Communication between health professionals and patients remains challenging due to the use of medical jargon (Armitage & Allen, 2015; Houts, Doak, Doak, & Loscalzo, 2006; Katz, Kripalani, & Weiss, 2006; Lühnen, Steckelberg, & Buhse, 2018; Tourangeau, 2014). In our image as answer options investigation, both eye health professionals and professional artists worked closely hand-in-hand throughout the process of drawing construction. Findings on the image as answer options support previous recommendations to minimise distracting details in pictures and use simple language in conjunction with drawings (Armitage & Allen, 2015; Houts et al., 2006; Katz et al., 2006; Lühnen et al., 2018; Tourangeau, 2014). Accompanying words with pictures has been recommended due to improved attention, comprehension, recall, and adherence to health education information (Armitage & Allen, 2015; Houts et al., 2006; Katz et al., 2006; Lühnen et al., 2018; Tourangeau, 2014). Our study on images as the answer option gave promising results in subjective (match descriptions) and objective (fixation patterns) measurements. Fixation pattern is linked to the visual attentional mechanism, neuropsychology, and psychophysics (Moore & Zirnsak, 2017). Consistent fixation patterns associated with specific areas of the drawing might reflect active information extraction with intentional cues. Our findings confirmed that the focus was on the eye area. The fixation distribution was more concentrated near eye areas with longer fixation duration. The fixation distribution of the remaining drawing spaces was more scattered with shorter fixation duration. Drawings are used to substitute wordings in ocular health screening. A combination of both theoretical knowledge and experimental findings formulates the final decision on images used in PRePESQ.

Challenges remain in designing a good self-reporting questionnaire for children to address cognitive requirements such as literate, visual, and fine motor skills. Even children can self-report, proxy-reporting by primary caretakers is highly regarded as an essential secondary outcome (Varni, Limbers, & Burwinkle, 2007). Both patient-reported outcomes measures (PROM) and patient-reported experience measures (PREM) are common in paediatric eye care questionnaires (Black, Varaganum, & Hutchings, 2014). The PRePESQ integrates both PROM and PREM in designing its new item constructs. The majority of the paediatric eye care questionnaires focus on the physical aspect of vision which encompasses spatial, temporal, and spectral acuities. One unique feature of PRePESQ adopts an all-inclusive approach. All four vision clusters are adequately screened and probed.

One limitation of using a closed-ended questionnaire approach is the guessing problem (Chen, Bakar, & Lam, 2020). Another limitation is the recall error and commitment issue that has been linked to the reliability and validity of the questionnaire data (J A Krosnick, 1991).

Screening plays a crucial connecting role between the clinical services system, the more extensive public health system, and the populations they serve. Despite the limitation of paediatric vision screenings, paediatric vision screening is crucial to expand entry into the overarching health care system in the absence of adequate resources to provide comprehensive paediatric eye examinations to every paediatric population. Vision screenings are generally less expensive and less time-consuming than comprehensive eye examinations. Due to equipment cost, time-labour allocation, and accessibility issues, an ideal tool-based paediatric vision screening option sometimes is unavailable. PRePESQ empowers the potential of a questionnaire-based concept to complement the inadequacy.

4. CONCLUSION

PRePESQ is a new concept of paediatric vision screening. It is designed as complementary to adjunct to equipment-based vision screening when the apparatus required for ideal paediatric vision screening is insufficient. Nurses or clinic assistants can perform it in optometry and ophthalmology clinics with the assistance of primary caretakers to save time and achieve a systematic approach and consistent across individuals for opportunistic paediatric vision screening.

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