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QUESTIONNAIRE-BASED EYE SCREENING TOOL FOR PEOPLE WITH DISABILITIES (QBEST-PWD)

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ABSTRACT

Questionnaire-Based Eye Screening Tool for People with Disabilities (QBEST-PWD) is developed to tackle the lack of disabled friendly eye care services in our society today. In a world that is not designed for the disabled, they often experience difficulty with accessibility to health services. Existing instrument-based vision screening is less than ideal for people with disabilities due to mobility constraint. Inaccessibility to eye-care services may have negative impact on their quality of life. There were three phases of the QBEST-PWD innovation process: (1) idea generation to enhance eye care accessibility for people with disabilities; (2) problem solving tactic to remove the dependency on instruments in existing vision screening style; (3) implementation – by substituting inconvenient instrument-based vision screening with a new questionnaire-based vision screening. Criteria setting and content were rigorously analyzed to preserve sensitivity and specificity. Conceptual model development also incorporated wide-ranging vision elements. A two-tier eye screening modus that embedded screening items with respective probing items was established. QBEST-PWD can be used as a complementary or a standalone screening apparatus for disabled people whom have accessibility difficulties to eyecare facilities.

Keywords: eye screening, vision screening, people with disabilities, disabled people, questionnaire

1. INTRODUCTION AND OBJECTIVE

The key challenge of eye health care system is the availability of funding and staff resources to identify eye and vision health needs to continuously improving vision health over time [1]. Providing comprehensive eye examination to all is not feasible because it requires significant capacity of financial resources, and trained staff. Therefore, vision screening is used to identify vision problems or a potential vision problem and provide a referral to an eye care provider for a comprehensive eye examination and necessary treatment. However, the existing vision screening is also not time and cost effective because it is restricted by instrument-based screening tests that should be conducted by trained staff [2]. Moreover, instrument-based vision screening is less than ideal for people with disabilities due to mobility constraint. In a world that is not designed for the disabled, they often have trouble with accessibility to eye care services. Providing eye health care to people with disabilities are often perceived to be challenging and difficult by eye care professionals [3]. Questionnaire-Based Eye Screening Tool for People with Disabilities (QBEST-PWD) is developed to tackle the lack of disabled friendly eye care services in our society today to reduce the burden and to increase the efficiency in serving people with disabilities better.

2. METHODOLOGY

There were three phases of the QBEST-PWD innovation process. Firstly, a new idea was generated to enhance eye care accessibility among people with disabilities. Secondly, we engaged in solving the dependency on expensive instrument problem in existing vision screening style. A zero-instrument approach was initiated by our team. We implemented the idea by substituting the inconvenience of instrument-based vision screening with a new questionnaire-based vision screening approach to transform the new idea into improved eye care service. The process of the development involved criteria setting, conceptual model development and item. The first step in questionnaire development was criteria determination (“who is it for, what is it for, where is it done, why is it done, how is it done?”). Those were crucial in the next step of conceptual model development that formed the fundamental structure in the final step of item generation. The eye screening content was curated based on four domains of vision: physical, physiological, perceptual and ocular health. Criteria setting and content were rigorously analyzed to preserve sensitivity and specificity of the new screening tool. A two-tier eye screening modus that embedded screening items with respective probing items was established. QBEST-PWD targets a broad age range, from school age to young adults, adult and elderly.

3. FINDINGS AND ARGUMENT

Eye screening programs are important services that link our public healthcare system to the population. Eye care screening programs are generally less expensive and less time-consuming than comprehensive eye examinations. Screening is important because we are able to detect pre-symptomatic/preclinical eye diseases and treat them promptly. Due to limited accessibility to disabled friendly eye care practices, QBEST-PWD is developed to provide an eye care screening option for the disabled individuals. In the development of the QBEST-PWD, we contemplate on the fundamentals of a robust questionnaire - construct, content and criterion [4-5]. A good construct measures what it is intended to measure. The content covers four principal vision clusters (physical, physiological, perceptual, and ocular health) according to the current eye care practice. The QBEST-PWD screening tool leverages the unique properties of a questionnaire - low operational cost, versatile, accessible to all, and easy administration. Inaccessibility to eye-care services may have a negative impact on the quality of life. Undiagnosed eye problems can adversely influence social, physical, educational abilities of disabled people. An undiagnosed refractive error is the commonest avoidable vision problem. Poor vision on top of existing disabilities can be burdensome and debilitating. The ability to engage in activities of daily living is severely impaired in these individuals [6]. Populations with poor or no access to eyecare services are associated with higher rates of undetected visual impairments, this is particularly relevant to disabled individuals as they have one of the lowest accessibilities to eyecare. This can negatively impact their potential for rehabilitation and independent living [7]. Therefore, preventive eye care for people with disabilities is crucial to ensure people with disabilities have the best vision possible. The final outcome of QBEST-PWD is not to diagnose but acts as an entry point for individuals with visual problems to access various eyecare facilities whenever indicated. This new tool is an inclusive eye screening suitable for all types of disabilities.

4. CONCLUSION AND SUGGESTIONS

QBEST-PWD can be used as a complementary or as a standalone eye screening apparatus for disabled people who have difficulties accessing instrument-based eye screening programs.

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REFERENCES

1. Chen, A.H., Bakar, N.F.A., Arthur, P., (2019). Comparison of the pediatric vision screening program in 18 countries across five continents, *J Curr Ophthalmol*, 31,4, 357-365
2. O'Hara, M.A., (2016). Instrument-based pediatric vision screening. *Curr Opin Ophthalmol*, 27, 5, 398-401
3. Li, J., Wong, K., Park, A., Fricke, T., Jackson, A., (2015). The challenges of providing eye care for adults with intellectual disabilities, *Clin Exp Optom*, 98, 5, 420-429
4. Bull, C., Byrnes, J., Hettiarachchi, R., Downes, M., (2019). A Systematic Review of the Validity and Reliability of Patient-Reported Experience Measures, *Health Serv Res*, 54, 5, 1023-1035
5. Boparai, J., Singh, S., Kathuria, P., (2018). How to design and validate a questionnaire: A guide. *Curr Clin Pharmacol*, 13, 4, 210-215
6. Sauerburger, D., Siffermann, E., Rosen, S., (2008). Principles for providing orientation and mobility to people with visual impairment and multiple disabilities, *I J Orientation & Mobility*, 1, 1,52-6
7. Chan, R., Yap, M., (2016). Access Barriers to Eye Care Utilization among People with Physical Disability in Hong Kong, *Procedia Environmental Sciences*, 36, 46 – 49



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