Modelling a vision screening module in a sample population of non-eye care practitioner in MSU Shah Alam, Selangor (A Pilot Study)

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Abstract

Purpose: To investigate the reliability of new model of vision screening module in one sample population in MSU, Shah Alam. Methods: This is cross sectional study with ten subjects who were non-eye care practitioner which were MSU students, aged 19 to 21 years old. They were divided into two groups, first group were participated in training and the other group were not be trained. The subjects required to perform the vision screening based on provided module. Result: There are no significant different on the finding between trained and non-trained non eye care practitioner for all three tests (visual acuity test, colour blindness test, Hirschberg test). However, the time taken for trained eye care practitioner to do the vision screening is no significant difference comparing to non-trained non-eye care practitioner. Conclusion: This study provide initial evidence that new model of vision screening module are reliable to be used by non-eye care practitioner. Furthermore, a standardized vision screening module will be benefited to the community especially to the underserved community as they have difficulty in accessing the health care services.

Keywords:
Eye module, Vision Screening, Trained non-eye care practitioner, Non-trained non-eye care practitioner
Introduction

19 million of children who aged below than fifteen years old are having vision impairment, meanwhile 12.8 million of them associated with uncorrected refractive error (Atowa et al., 2019; Mzyece et al., 2022). According to Naidoo and Jagger (2018), the most prevalence cause of decreased vision are uncorrected refractive error. Furthermore, vision screening in school has been conducted in many country such as Australia, Canada and Nigeria. The main role is to detect any ocular disease, as early treatment can prevent from worsening.

Atowa et al (2018) mentioned that a disease can be avoid when early identification and treatment is given. In addition, vision screening during pre-school aged are the most preferred time to treat amblyopia as during that time they are in plastic aged (Atowa et al., 2019). Moreover, visual is one of important impact during child growth as 90% of learning by seeing and observing. Thus, if they have problem with the vision, there would be significant effect on the educational achievement, social life and career of choices (Atowa et al., 2019).

It is unachievable to do the vision testing to all people especially children who lived in rural area as geographical factor is the limitation (Atowa et al., 2019). Thus, eye care professional has difficulty to access to the community. Not only that, people in remote area faced inaccessibility to facilities especially the health care. This pilot study is conducted to investigate the reliability of new model of vision screening module in one sample population in MSU, Shah Alam. Either than that, this study also is to compare the findings between trained non-eye care practitioner and non-trained non-eye care practitioner using the module.

Methodology

Study Design

An experimental cross sectional study had been conducted which all subjects need to sign the informed consent before the study begin. Ten MSU students had been participated in this pilot study which aged between 19 to 20 years old. This pilot study had been held at MSU Centre of Excellent for Vision and Eyecare. The modules were vetted with the expertise of English and Malay languages which this module had been created in two languages.

Method

In the new developed module, there were instructions on how to conduct the eye tests. There are three eye test included, visual acuity (VA) test, colour vision test and Hirschberg test. Therefore, the subjects were divided into two groups in which the first group, the eye care professional conducted a training to the five participants then the participants performed the screening using the module towards the patient. The training was held about twenty minutes. Meanwhile, the other five participants handled the screening to the patient without training. The participants would begin the screening once they were ready. The subjects would record the finding in the online form that has been provided. All the procedure done by the subjects according to the module were supervised and verified by the optometrist. Then all data was analyzed using descriptive statistics to report the subject demography, chi-squared test used to compare the nominal data between the two groups which the data recorded according to the instruction in the module. Mann-Whitney test used to compare the two groups of non-parametric data.

Results

Ten non-eye care professional were participated in this study, and they are MSU students, taking course, Pharmaceutical Technology (BPHT)(10%), Pharmacy (BPH)(20%), and Medicine and Surgery (MBBS)(70%). Their mean aged was 21.95±2.282. There were eight female students (80%) and the rest are male (20%), all of them are Malay.

For the visual acuity test, it is showed that the difference of findings with the optometrist result for two groups (trained vs non-trained) is 10% only and the comparison of the difference findings with the optometrist between both groups is not significant (p = 0.952 for right eye and p = 0.649 for left eye). In addition, the finding of colour blindness test is not significant as well as 100% finding are same between
non-eye care professional and optometrist. Not only that, the same finding found in Hirschberg test by both parties. Moreover, the result of referral requirement of patient compared to optometrist findings showed no difference which the comparison of findings between two groups (trained vs non-trained) eye care practitioner is not significant (p = 0.305). Lastly, the average time taken in handling eye test by eye-care professional is 4.4 minutes, meanwhile 7.3 minutes is average time taken by subjects. So, there are significant difference of time taken between optometrist and non-eye care practitioner (p=0.004). However, the differences of time taken in handling eye test between both groups (trained vs non-trained) eye care practitioner not show the significant difference (p>0.05).

Discussion

From the three tests (visual acuity test, colour blindness test, Hirschberg test), the results show that there are no significant difference between test conducted by trained non-eye care practitioner and non-trained non-eye care practitioner. Thus, all results prove that non-eye care practitioner can handle simple eye test by using this module. Wang et al., 2019 found that there were no significant difference conducting eye screening between three types of subjects (teacher, optometrist and volunteer). Another study by Shukla et al (2018) found that trained teacher can identify student with abnormal eye condition, however the positive-rate are high. Besides that, the time taken for completing eye screening is shorter time by eye care professional comparing to non-eye care professional. Based on previous study, the author mentioned that teacher reported of lacking of time to practice (Bechange et al., 2021). So, the subjects have to spend more time in examining vision screening as it is their first time conducting screening.

From my observation, subjects who has been trained onto the module are more confident in conducting module compare to students who did not be trained. Untrained subjects tend to read instruction step by step, so they required more time to complete the screening. Not only that, there are a few important step that they ignored such as to cover one eye during visual acuity test and colour vision test. Once they wanted to key in finding in online platform, they realized that there are different column for each eye, then they repeated the test again by occluding each eye. In addition, some of them place the vision chart higher than eye level and they pointed the smaller alphabets first to be read by students. On the other hand, trained subjects done a great job as for my point of view, I satisfied onto the screening except for Hirschberg test. Some of them shined the pentorch, not onto the student's eyes at the midline.

Conclusion

This study provided prove that new developed vision screening module are reliable to be used by any non-eye care practitioner. Furthermore, a standardized vision screening module are benefits to the community especially towards the underserved community as they have difficulty in accessing the health care services. Therefore, early treatment towards avoidable eye disease can be implemented in our country and people’s quality of life can be improved.

Acknowledgement

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References


Table and figure

Table 1: P-value for each test

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<th>P-value</th>
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<tr>
<td>1</td>
<td>Visual acuity test on right eye</td>
<td>0.952</td>
</tr>
<tr>
<td>2</td>
<td>Visual acuity test on left eye</td>
<td>0.649</td>
</tr>
<tr>
<td>3</td>
<td>Colour blindness test on right eye</td>
<td>1.0</td>
</tr>
<tr>
<td>4</td>
<td>Colour blindness test on left eye</td>
<td>1.0</td>
</tr>
</tbody>
</table>

Figure 1: A non-eye care professional were checking on visual acuity test.

Figure 2: A non-eye care professional did not shine the pentorch onto the student’s eye at midline.