

Knowledge Retention Level among Pre-School Teachers in Conducting Pre-School Children Vision Screening (Tahap Pengekalan Pengetahuan di Kalangan Guru-Guru Prasekolah dalam Menjalankan Ujian Saringan Penglihatan Kanak-Kanak Prasekolah)

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ABSTRACT

Certain public service pre-school teachers have been trained as vision screeners of children. However, there are no studies that assessed the knowledge and skills retention of these screeners. This study determines the level of knowledge retention among pre-school teachers who have been trained to perform vision screening on children. In 2013, 180 KEMAS pre-school teachers were recruited in a vision screening training which included both theory and practical sessions. Teachers were assessed through a theory test which comprised of 15 questions, firstly a category on the preparations needed for vision screening and secondly on the implementation of vision screening. They were then asked to conduct pre-school vision screening annually at their working premises. In 2016, 136 teachers who had been involved in the earlier program were recruited as subjects in this study. All these subjects answered the same set of theory test questions used in 2013. The Student's t-test result indicated that the mean theory test scores obtained by the pre-school teachers in 2013 (84.3 ± 7.8) differed significantly with the mean scores obtained in 2016 (67.5 ± 11.3) ($p < 0.001$). The mean scores in 2013 for questions in the first and second categories were 4.5 and 4.4, decreasing to 4.2 and 3.7 in 2016. The knowledge level of pre-school teachers thus decreased with time and this effect was found significant after 3 years. There is therefore a need to conduct re-certification training, so that the screening conducted by these pre-school teachers remains effective and in accordance with established standards.

Keywords: Vision screening; training course; pre-school children; teachers; level of knowledge; theory test

ABSTRAK

Penjawat awam tertentu iaitu guru prasekolah telah dilatih sebagai penyaring penglihatan kanak-kanak. Namun begitu, tiada kajian yang menilai pengekalan pengetahuan dan kemahiran para penyaring penglihatan tersebut. Kajian ini menentukan tahap pengekalan pengetahuan di kalangan guru prasekolah yang terlatih melakukan ujian saringan penglihatan kanak-kanak. Pada tahun 2013, 180 orang guru prasekolah KEMAS direkrut dalam latihan saringan penglihatan prasekolah yang merangkumi sesi teori dan sesi amali. Guru ini dinilai melalui ujian teori yang mengandungi 15 soalan, terbahagi kepada kategori soalan mengenai persediaan untuk ujian saringan penglihatan dan kategori pelaksanaan ujian saringan penglihatan. Guru-guru ini kemudiannya diminta melaksanakan ujian saringan kanak-kanak di premis prasekolah masing-masing setiap tahun. Pada tahun 2016, 136 orang guru yang pernah terlibat dalam program terdahulu direkrut sebagai subjek dalam kajian ini. Kesemua subjek ini menjawab soalan ujian teori yang sama seperti digunakan pada tahun 2013. Keputusan ujian Student-t menunjukkan bahawa min keputusan ujian teori yang diperolehi guru prasekolah pada tahun 2013 (84.3 ± 7.8) berbeza secara signifikan dengan min keputusan pada tahun 2016 (67.5 ± 11.3) ($p < 0.001$). Skor min pada tahun 2013 bagi soalan kategori pertama dan kedua masing-masing adalah 4.5 dan 4.4 dan ia telah merosot ke nilai 4.17 dan 3.70 pada tahun 2016. Oleh itu, tahap pengetahuan guru prasekolah menurun dengan laluan masa dan kesannya adalah signifikan selepas 3 tahun. Oleh demikian, terdapat keperluan untuk mengadakan sesi latihan pensijilan semula supaya ujian saringan penglihatan yang dikendalikan oleh guru prasekolah ini kekal berkesan dan mengikut piawaian yang ditetapkan.

Kata kunci: Kursus ujian saringan penglihatan; kanak-kanak prasekolah; guru pra-sekolah; tahap pengetahuan; ujian teori

INTRODUCTION

Vision impairment refers to sub-optimal vision that can impact a child physically, mentally or psychosocially (Dale & Salt 2008; Gold et al. 2010; Pinguart & Pfeiffer 2011). The prevalence of visual impairment has been reported

as 6.7% among pre-school children in Malaysia (Duratul Ain et al. 2009). Uncorrected refractive errors (88.9%) were found to be the main reason for visual impairment, followed by amblyopia (15.5%), strabismus (13.3%) and ocular anomalies (11.1%) (Duratul Ain et al. 2009). Routine vision screening among pre-school children has been

reported as the most effective method of prevention against vision impairment (Reddy & Thevi 2017). A previous study also recommended that optometrists could conduct vision screening among pre-school children effectively (Duratul Ain et al. 2009). However, it can be costly for optometrists to run such a program and optometrists are more suitably employed to conduct optometric examinations in clinics. Furthermore, in view of the relatively small number of optometrists in Malaysia, the optometrist to population ratio being 1: 22,460 (Subramaniam 2015), there is therefore a need to empower additional vision screeners to serve as front-liners for the detection of vision impairment especially among pre-school children.

There have been a number of vision screening programs developed which trained vision screeners such as teachers (VIP 2005; Priya et al. 2015; Latorre-Arteaga et al. 2016; Kaur et al. 2016; Rewri et al. 2016) and parents (Lim et al. 2004) to conduct vision screening on children. In Malaysia, nurses from the School Health Team Program, Ministry of Health are trained to conduct vision screening among children from the age of 7 to 12 years old. This program was further expanded in recent years to include pre-school children aged 6 years who attended pre-school classes conducted in public schools (Buang 2013). However, the coverage of this school vision screening program in Malaysia is limited to public schools only. Furthermore, vision screening which is first conducted at the age of 6 years old can be considered as delayed. In many developed countries, vision screening starts at the age of 4 years old (Alexander 2010; Public Health England 2017; U.S. Preventive Services Task Force 2017) as it is known that there is a better prognosis if vision impairment is detected and corrected early. Omar et al. (2018) in their study trained pre-school teachers to conduct vision screening among children aged 4 to 6 years old. The findings from this study suggested that pre-school teachers with proper training were able to conduct vision screening effectively.

Late detection and treatment of vision impairment could result in a permanent impact on a child's vision status and their quality of life in the long term. Thus, pre-school vision screening is very important to be implemented as it can detect children's vision impairment in the early stages (Duratul Ain et al. 2009). Nonetheless, vision screening for pre-school children has always been challenging. The children selected for screening may be uncooperative and scared of personnel who are unknown to them. Thus, empowering pre-school teachers would not only help in the early detection of visual anomalies, it can also serve to ensure that the screening process becomes more manageable and cost effective. Since children typically have longer contact hours with their teachers, these children should therefore be more willingly to cooperate and participate in the vision screening conducted by their teachers. Furthermore, the pre-school children would have greater trust and familiarity with their own teachers as compared to strangers. Besides that, the incorporation of

the vision screening test into the children's timetable would also minimise the disruption to their learning activities and this can be a new and fun learning experience for these children. This would also help ensure the long-term sustainability of the vision screening program. In order to achieve this, it is essential for the pre-school teachers to be trained properly and be made competent to conduct vision screening.

A previous study has shown that trained teachers can be as competent as nurses in conducting vision screening among children (VIP 2005). In that study, teachers achieved similar sensitivity scores of vision screening as nurses (56.0% versus 69.0%) when the specificity was set at 90.0%. This was further supported by Omar et al. (2018) who found that pre-school teachers were able to conduct vision screening effectively with a sensitivity of 67.7% and a specificity of 97.4%, as well as a positive predictive value of 72.4% and negative predictive value of 96.9%. Other studies have shown that proper training and a briefing on how to conduct vision screening were important to ensure that the vision screeners are competent (VIP 2005; Kaur et al. 2016; Priya et al. 2016; Rewri et al. 2016). In these studies, all the training was conducted once but there was no follow-up on the knowledge retention of teachers on vision screening. As front liners to facilitate early detection of vision impairment among pre-school children, it is important to ensure that the transferred knowledge to the pre-school teacher is maintained. This will support the sustainability of the vision screening program in the long term. As far as we are aware, there is no study available currently that evaluates the level of knowledge retention among pre-school teachers on vision screening after their initial training was conducted. Therefore, this study aimed to determine the level of knowledge retention among pre-school teachers who have been trained to perform vision screening on pre-school children. This study is also conducted to determine the relationship of age and level of knowledge retention on vision screening among pre-school teachers

MATERIALS AND METHODS

This was a prospective study and conducted at the Department of Community Development, Ministry of Rural and Regional Development (KEMAS) Selangor between April and November 2016. The population studied was KEMAS Malaysia pre-school teachers and the sampling frame was KEMAS Selangor pre-school teachers. The sample size calculation was based on the method of Krejcie & Morgan (1970) in which a known targeted population of participants was used ($N = 180$). The sample size calculated for this study was 123 participants. After considering a safety margin of 10%, the final sample size was determined as $n = 136$. The participants were recruited into this study based on stratified random sampling. The inclusion criteria were pre-school teachers who had participated in the Knowledge Transfer Program in 2013.

In 2013, a total of 180 KEMAS pre-school teachers were recruited for a Knowledge Transfer Program and these pre-school teachers were certified as pre-school vision screeners. They attended a vision screening training module using the KieVision Pre-school Vision Screening Kit™, which included both theory and practical sessions that ran for one and a half days (Ahmad Zahidi, 2013). Teachers were assessed using a theory test after completion of the training module. The theory test comprised of 15 questions and these are summarised in Table 1. Each question contained five statements in which the pre-school teachers were required to decide whether the statement was true or false. Each correctly answered statement will be allocated 1 mark. If all 5 statements are correctly answered by the teachers for a specific question, they will have 5 marks. The total mark is determined by scoring the 15 questions with 5 statements each thus resulting in a maximum of 75marks. This score (from a maximum of 75 marks) is

then presented as a percentage score. The questions are divided into two categories. The first category tests on preparations to conduct the pre-school vision screening tests. The questions involved are questions Q1 to Q6. Questions in this category tested the teacher's knowledge on the definition of vision screening and its significance towards the detection of vision impairments (Q1 and Q2). In addition, the types of tests used in the pre-school vision screening and the equipment needed were also questioned (Q3 to Q6). The second category examines the knowledge of teachers on the conduct of the screening tests. Questions in this category were Q7 to Q15. These included questions on the procedures and normal values of each test used in the vision screening (Q7 to Q14). Question 15 examines the referral method should a child need to be referred for further eye examination. The teachers were asked to answer the questions using an Optical Mark Recognition (OMR) form provided to them.

TABLE 1. Summary of questions used to test the level of knowledge retention of pre-school teachers conducting vision screening

Category	Question Number	Question in relation to
Preparation for Pre-school Vision Screening	Q1	What is vision screening?
	Q2	Impact of undetected vision impairments
	Q3	Tests included in pre-school vision screening
	Q4	Equipment used for pre-school vision screening
	Q5	Method to take care of screening equipment
	Q6	Record book for vision screening tests
Implementation of Pre-school Vision Screening	Q7	External observation
	Q8	Normal eye
	Q9	Hirschberg's test
	Q10	Procedures on conducting Hirschberg's test
	Q11	Distance visual acuity (VA) test
	Q12	Normal value for distance VA
	Q13	Equipment used in VA test
	Q14	Procedures to conduct VA test
	Q15	Referral of children who has failed the vision screening tests

The level of knowledge on vision screening was assessed using the theory test scores. The OMR sheets were then processed by the Information Technology Centre of Universiti Kebangsaan Malaysia to generate the electronic marking results. The score assessment was divided into five levels, which namely Excellent (80 – 100%), Good (60 – 79%), Average (40 – 59%), Weak (20 – 39%) and Very Weak (0 – 19%). The Certified Group results were analysed and tabulated. 180 pre-school teachers were also asked to conduct pre-school vision screening annually at their working premises upon completion of training. These post-training level of knowledge test scores were stored in the research file kept at the Optometry & Vision Science Program, Universiti Kebangsaan Malaysia. In our study, we have extracted this data set and the group of subjects were named as the Certified Group.

As mentioned earlier, the sample size was calculated using the Krejcie & Morgan (1970) formula and a total of 136 pre-school teachers were randomly selected as the

Re-Certified Group from the Certified Group of pre-school teachers. The aim of this study was to determine the level of knowledge retention on vision screening among these trained pre-school teachers. This group was named as the Re-Certified Group. All these participants answered the same set of theory test questions used in earlier Knowledge Transfer Program in 2013. The results were also analysed and tabulated. This study obtained ethical approval JEP-2016-373 from the Research & Medical Ethics Research Committee of Universiti Kebangsaan Malaysia, followed the Helsinki Declaration for Human Subjects, and was also approved by the KEMAS Selangor state office. The selected pre-school teachers who participated in this study were briefed on the study and signed the consent form.

DATA ANALYSIS

The scores of this study were analysed using SPSS version 23.0. Descriptive analysis was conducted on the demographic details of the teachers, thus deriving the

mean, standard deviation (SD), range and percentage of the theory test scores for the teachers in the Certified and Re-Certified Groups. The Kolmogorov-Smirnov Normality test was conducted on the age and theory test scores data of the pre-school teachers and it was found not normally distributed ($p < 0.001$). However, the skewness, kurtosis, histogram, boxplot and normal Q-Q plot for both the parameters in the Certified and Re-Certified Groups, were found to be normally distributed. The correlation test was then conducted to determine the relationship of age and the level of knowledge of these pre-school teachers. The mean theory test scores between pre-school teachers in the Certified and Re-Certified Groups are then compared using the Student-t test.

RESULTS

Table 2 describes the characteristics of both the Certified and Re-Certified Groups of pre-school teachers

conducting vision screening program among pre-school children. All the pre-school teachers who participated in both studies were female. The majority of the pre-school teachers participating in both groups were aged between 31 to 40 years old. The pre-school teachers mean age was not significantly different with $p > 0.05$, where it was 37.90 ± 9.40 years old and 37.67 ± 9.73 years old respectively. The Chi-Square test was conducted to determine if there was any difference between the groups based on subjects' percentages of pre-school teachers in each category of age (Table 2). The analysis found that were $p > 0.05$ across the four age categories in both the Certified and Re-Certified groups. These findings suggest that the percentage distribution of pre-school teachers in each age category between the groups was not significant. Therefore, the distribution of subjects according to age category of the subjects was similar and age category is excluded as a confounding factor of variation in the theory test results.

TABLE 2. Age distribution of certified and re-certified groups of pre-school teachers

Age Category (Years Old)	Certified Group (n = 180) Number (Percentage %)	Re-Certified Group (n = 136) Number (Percentage %)	Chi-Square test	
			χ^2	p-value
21 – 30	56 (31.1)	40 (29.4)	2.67	0.10
31 – 40	62 (34.4)	46 (33.8)	2.37	0.12
41 – 50	28 (15.6)	26 (19.1)	0.07	0.79
51 – 60	34 (18.9)	24 (17.7)	1.72	0.19

The mean score of correct answers for each question is summarised in Table 3. The mean score for the questions in the first category (Q1 to Q6) was 4.5 ± 0.4 and 4.2 ± 0.5 for Certified and Re-Certified Groups respectively. The mean score for the questions in the second category (Q7 to Q15) was 4.4 ± 0.2 and 3.7 ± 0.6 for Certified and Re-Certified Groups respectively. It was also found that Q4 and Q5 had the highest correct answer mean score in the Certified and Re-Certified Group respectively (Table 3). This suggested that pre-school teachers had a better understanding of the types and care of vision screening equipment. The lowest mean score of correct answers for the Re-Certified group was in Q12 and this suggests less understanding about the normal values for distance visual acuity test which was related to the implementation of the pre-school vision screening program.

From the descriptive analysis, the mean score of pre-school teachers in the Certified Group compared to the Re-Certified Group for each question showed a reduction in score for all questions after 3 years interval from training. The pre-school teachers from the Certified Group in 2013 managed to score better for all questions except Q2 (min score = 3.9 ± 1.3), and it was noted that Q2 was also the question with the lowest score. The highest score was seen with Q5, which is a question that concerns the method of

taking care of the screening equipment; where the mean score was 4.9 ± 0.2 . In the Re-Certified Group, when the assessment was conducted, it was noted that the mean scores of each question showed a reduction in each score. Eight out of fifteen questions scored less than 4. Only Q4 displayed a similar mean score between the Certified Group (4.8 ± 0.3) and the Re-Certified Group (4.8 ± 0.1). The Re-Certified Group scored lowest for Q12 (2.7 ± 0.6).

The theory test scores for Certified pre-school teachers who completed the pre-school vision screening training program and the Re-Certified pre-school teachers before their receiving pre-school vision screening training program were tabulated as shown in Table 4. In the Certified Group, the minimum theory test score was 58.57% while the maximum score was 100%. It was found that the majority (75.6%) of the pre-school teachers obtained excellent scores. Only one pre-school teacher had an average score while the remaining had good scores.

In the Re-Certified Group, it was found that the minimum theory test score was 30% while the maximum score was 93.3%. A majority of these teachers had average scores (47.8%), followed by those with good scores (38.2%) and excellent scores (12.5%). Two pre-school teachers had weak scores. The overall percentage of the theory test score for the Certified and Re-Certified Groups

TABLE 3. Average test scores of each question in the theory test for certified and re-certified groups of pre-school teachers

Categories	Question Number	Question in relation to	Test Scores (Mean ± SD)	
			Certified Group (n = 180)	Re-Certified Group (n = 136)
Preparation for Pre-school Vision Screening	Q1	What is vision screening?	4.3 ± 0.9	3.8 ± 1.0
	Q2	Impact of undetected vision impairments	3.9 ± 1.3	5.0 ± 0.8
	Q3	Tests included in pre-school vision screening	4.5 ± 1.0	3.9 ± 1.3
	Q4	Equipment used for pre-school vision screening	4.8 ± 0.3	4.8 ± 0.1
	Q5	Method to take care of screening equipment	4.9 ± 0.2	4.8 ± 0.1
	Q6	Record book for vision screening tests	4.7 ± 0.4	4.2 ± 0.8
Implementation of Pre-school Vision Screening	Q7	External observation	4.3 ± 0.3	3.6 ± 0.5
	Q8	Normal eye	4.7 ± 0.4	4.4 ± 0.8
	Q9	Hirschberg's test	4.5 ± 0.7	3.6 ± 1.3
	Q10	Procedures on conducting Hirschberg's test	4.4 ± 1.1	4.1 ± 1.0
	Q11	Distance visual acuity (VA) test	4.0 ± 1.9	3.0 ± 2.3
	Q12	Normal value for distance VA	4.4 ± 0.3	2.7 ± 0.6
	Q13	Equipment used in VA test	4.7 ± 0.5	4.3 ± 0.9
	Q14	Procedures to conduct VA test	4.6 ± 0.2	4.0 ± 0.8
	Q15	Referral of children who has failed the vision screening tests	4.4 ± 0.7	3.7 ± 1.2

TABLE 4. Theory test score performance of certified and re-certified groups of pre-school teachers conducting vision screening program

Characteristics	Certified Group (n = 180)		Re-Certified Group (n = 136)		
	Number	Percentage (%)	Number	Percentage (%)	
Grade Level	Excellent (80 – 100)	136	75.6	17	12.5
	Good (60 – 79)	43	23.8	52	38.2
	Average (40 – 59)	1	0.6	65	47.8
	Weak (20 – 39)	0	0	2	1.5
	Very weak (0 – 19)	0	0	0	0
Overall Theory Test Score (Mean ± SD)	180	84.3 ± 7.8	136	67.5 ± 11.3	

was 84.3 ± 7.8 and 67.5 ± 11.3 respectively. The Student t-test showed significant difference ($t = 10.162, p < 0.001$) in the average overall theory test scores between the two groups.

Figure 1 showed the percentage of pre-school teachers according to their score level in the theory test score in both the Certified and Re-Certified Groups. Most of the pre-school teachers had excellent knowledge on vision screening but showed deterioration by at least one score grade subsequently over the time between the two studies. Only 12.50 % was still able to maintain their knowledge of vision screening at an excellent score level at the re-certification test.

Figure 2 shows the mean theory test scores of the pre-school teachers in the Certified group and Re-Certified groups. The relationship between age and theory test scores was determined using the Pearson's correlation test. In the Certified Group, the Pearson's correlation test result

showed that there was no significant relationship between the age and theory test scores of the pre-school teachers ($r = 0.36, p > 0.05$). However, there was a weak negatively significant relationship between the age and theory exam scores ($r = -0.27, p = 0.001$) in the Re-Certified Group.

DISCUSSION

The KEMAS pre-school teachers involved in both the Certified Group (from 2013) and the Re-Certified Group (in 2016) showed similar demographics in terms of their gender and age. As this study was conducted 3 years after the initial training, teachers who were aged 57 to 60 years in 2013 may have already retired by 2016, in line with national policy on public servant's mandatory retirement. However, when the analysis was conducted the mean age between both the groups was found to still be similar and with no significant difference.

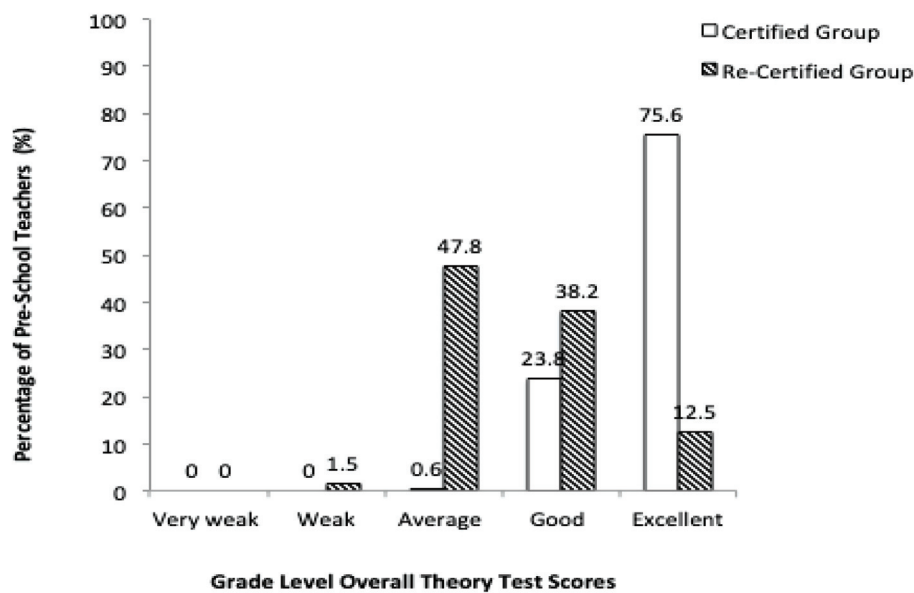


FIGURE 1. Percentage of pre-school teacher's performance according to score grade level

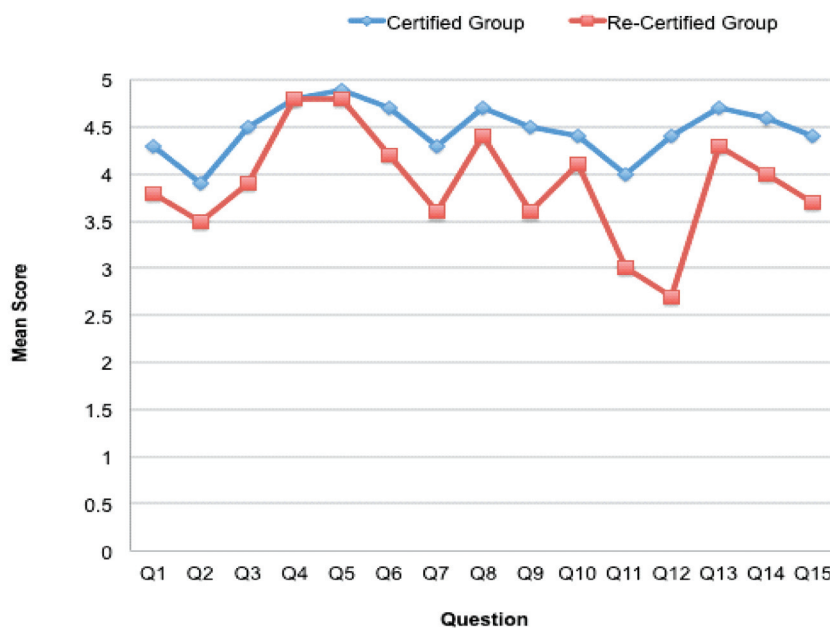


FIGURE 2. Mean theory test scores of the pre-school teachers in the Certified and Re-Certified groups

The theory test used in 2013 in the knowledge transfer program for KEMAS pre-school teachers was applied to the same group of trained teachers after period of 3 years, thus serving as the test instrument. This was done to determine the level of knowledge retention among these trained pre-school teachers. The Certified Group theory test scores of the post-training 2013 was 84.3 ± 7.8 , where about 75% of teachers obtained an excellent grade with only

one teacher scoring less than 60%. The mean score for questions in the first category was slightly greater than those in the second category. This indicated that pre-school teachers had higher knowledge about the significance of vision screening, the impact of visual impairment and the preparation of screening tests compared to the procedures of vision screening and decision for referral. When we further studied the mean score for each of the questions,

it was found that teachers who had attended the training course had a higher understanding of the tools used in the vision screening test (Q4) and how to take care of the vision screening tools (Q5). However, they were still not familiar with the impact of visual impairments on children (Q2) and visual acuity tests (Q11). This could probably be due to their educational background where most of the pre-school teachers were not exposed to knowledge on vision impairments and vision screening until this training was conducted.

The mean theory test scores of the 136 KEMAS pre-school teachers in 2016 for the Re-Certified Group was 67.5 ± 11.3 . Nearly half of these teachers scored less than 59% in the theory test and only 12.50% of them still remained with an excellent grade. In this Re-Certified Group, the mean score for questions in the first category was higher than the second category. This suggests that the knowledge of pre-school teachers on preparations for screening tests was still higher when compared to knowledge of the implementation of the screening test even after 3 years. The breakdown scores for each question showed that the preservation of knowledge among pre-school teachers on the use of vision screening tools (Q4) and the way to take care of these tools (Q5) were the most lasting. These questions are considered relatively general in nature. However, the Re-Certified Group had significantly lower mean scores compared to the Certified Group. This indicates that the knowledge retention was reduced. This was clearly seen in Q11, which addresses knowledge related to visual acuity, and Q12 on the normal values for distance visual acuity tests according to the age of pre-school children. These questions were more challenging as the normal values for visual acuity differed among children aged 4, 5 and 6 years. This might be due to pre-school teachers tending to rely on the training module provided, where they could refer to the pass/fail criteria while conducting vision screening for children. Thus, it was presumed that pre-school teachers referred to the module provided to help them decide on the pass/fail criteria rather than memorising it.

The Pearson's correlation test showed that there was no significant relationship between the age and theory test scores in the Certified Group. This suggests that there was no difference in the level of knowledge across the pre-school teacher's age. Junior teachers and senior teachers performed equally in the theory test where there was no significant correlation observed. Thus, the level of knowledge on vision screening was not affected by the age of the participants. On the other hand, there was a significantly negative though weak relationship seen between the age and theory test scores in the Re-Certified Group. This suggests that the retention of knowledge among pre-school teachers on vision screening is affected over time. When the gap from the initial training increases, the ability to retain knowledge about vision screening program among trained pre-school teachers

decreases. It can also be suggested that, over time, the knowledge of the pre-school teacher on vision screening also deteriorated. This happened possibly due to the nature of their work as teachers and because they only conducted the screening once a year.

As is seen in the scores from the Student-t test, there was a significant difference between the theory test scores in the Certified Group and the Re-Certified Group. The retention of knowledge on vision screening among the pre-school teachers deteriorated over time. This effect was shown and is visible 3 years after the initial training was conducted. The rate of decrement in knowledge was estimated to be about 18% over a duration of 3 years. It can thus be surmised that the pre-school teachers had a loss of knowledge on vision screening at a rate of 6% per year. This phenomenon has also been observed among medical trainers (Eze et al. 2012) and medical students (Lippa et al. 2006). Lippa et al. (2006) revealed that medical students showed a deterioration in ophthalmic skills after a period of 3 years after completing an ophthalmic clinical skills course. Thus, there is a need to conduct re-certification courses for pre-school vision screening among previously trained teachers. Therefore it is suggested that a re-certification course should be conducted 3 years after the pre-school teachers attend their first vision screening training. This is in line with the practice of other skill competency courses which are typically conducted 3 years after the first training course (Cotter et al. 2015; Illinois Department of Public Health 2015; Wise About Eyes 2012).

CONCLUSION

The level of knowledge retention of children's vision screening among trained pre-school teachers declines over time. Therefore, there is a need to conduct re-certification courses for pre-school vision screening trained teachers in order to preserve the knowledge level of these pre-school teachers on vision screening and their practical skills to perform vision screening. It is recommended that the training or recertification be conducted three yearly after the initial training. This is to ensure that the vision screening conducted by pre-school teachers remains effective and in accordance with established standards.

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