Knowledge, Attitude and Practice (KAP) Towards Visual Impairment and Visual Rehabilitation Among Teachers in Malaysia

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Abstract:

Introduction: One of the most pressing public health issues in the world is visual impairment. It has more negative effects on children and their family members, especially in terms of their career, education, and overall personal and social-emotional status. If proper vision care and rehabilitation services are not prioritised, there will likely be a considerable annual increase in the number of blind children. **Aim:** This study aimed to assess the knowledge, attitude, and practice (KAP) among school teachers in Malaysia, towards visual impairment and visual rehabilitation. **Methodology:** A total of 384 respondents were recruited in this study, and all respondents completed the validated and reliable self-administered questionnaires on their KAP towards visual impairment and visual rehabilitation. **Results:** Most teachers in Malaysia have good KAP on visual impairment and visual rehabilitation despite only 4.2% of them having had attended formal low vision course or training. There was a significant association between low vision training attendance and KAP among the teachers. **Conclusion:** The study gives an insight into the need for a low vision course to be offered in school teachers curriculum in order to improve students' learning experience and academic performance.

Keywords: LBP, sedentary lifestyle, university students

Introduction:

One of the biggest public health problems in the world is visual impairment which could impact both children and their family members (Zelalem, Abebe, Adamu & Getinet, 2019). If the emphasis and improvements in the healthcare services are not rendered, it is estimated that the number of blind people will skyrocket to 75 million in 2020. Ten years ago, it was estimated that 1.4 million children were blind globally although visual impairment and blindness were reported to be less common among children than adults (Courtright, Hutchinson & Lewallen, 2011). Although it is said to be less common, the complication of blindness and visual impairment is higher among children and will encounter a lifelong effect of visual impairment.

According to Dandona and Dandona (2006), there are three definitions of visual impairment as proposed by the International Statistical Classification of Diseases and Related Health Problems (ICD) based on the guidelines of the World Health Organization (WHO) Study Group in 1972. Firstly, the definitions are based on the best-corrected visual acuity, excluding uncorrected refractive error as the cause of visual impairment. Secondly, ICD is defined by the cut off level that defines blindness (visual acuity less than 3/60 in the better eye)

Thirdly, ICD uses 'low vision' as the term for a visual impairment level that is less than blindness. On the other hand, the term 'low vision' describes a person who suffers visual impairment even with treatment and/or standard refractive correction, has a visual acuity less than 6/18 to light perception or visual field less than 10 degrees from the point of fixation (Dandona & Dandona, 2006; Layton & Lock, 2001). Even with the prescription of corrective lenses, individuals with low vision can still have difficulty in completing their visual tasks that may lead to learning disabilities whereby Silberman and Sowell (1998) reported that learning disabilities and low vision might occur concurrently (Layton & Lock, 2001).

An example of a learning disability that may affect children's performance is the alteration in reading speed. Gompel, Van Bon and Schreuder (2004) reported that children with low vision have slower reading speed and thus have difficulty in the component of syntactic reading comprehension because their brain needs some time for the decoding process to keep the decoding sentences longer in their memory. Despite their condition, most children with severe visual impairment are persistent in reading until they manage to decode and understand words successfully in the same way as normal sighted children. Still, their reading speed may be much slower than normal sighted children. Therefore, it would be best to provide the best education for them since the children have the determination to read.

Additionally, teachers play an important role in assisting children at school as the children spend most of their time at school which is approximately more than 6 hours per day. Generally, there are two types of primary and secondary schools: a school with one session only (in the morning) and a school with two sessions (morning and evening sessions) (Kementerian Pendidikan Malaysia, 2013). A study revealed that a close teacher-student relationships could improve academic performance (Mason, Hajovsky, McCune & Turek, 2017). They also noted that supportive teacher-student relationships are crucial in developing and sustaining a sense of school belonging that facilitates positive academic and behavioural performance. Thus, apart from a good relationship with a student, a teacher should also have a good understanding of visual impairment and the use of low vision devices that a student with low vision may use. In short, the teacher should learn how to handle and take care of students with visual impairment to teach them how to use the assistive devices confidently. Thus, in this study, the knowledge, attitude and practice towards visual impairment and visual rehabilitation of school teachers were assessed using a validated and reliable questionnaire.

Materials and Methods:

A total of three hundred eighty-four respondents were recruited in this study based on Cochran's sample size formula (Ahmad & Halim, 2017). Each respondent completed the self-administered questionnaire validated by Mohd-Zahir and Musa (2015) which consisted of five sections: participant's consent, demographic data, knowledge, attitude, and practice. The questionnaire was distributed as a Google Form to the teachers using common social media platforms (such as Facebook and WhatsApp). The participants self-rated this questionnaire to identify their knowledge, attitudes, and practices toward visual impairment and visual rehabilitation. Initially, 416 completed questionnaires were received, however after taking into consideration the inclusion and exclusion criteria, 384 respondents were analysed. The respondent's inclusion criteria were qualified government school teachers from both primary and secondary schools with more than 1-year of teaching experience and those who could give informed consent. The respondent's exclusion criteria were newly enrolled teachers with less than 1-year of teaching experience, clinical diagnosed with a mental illness and unable to give consent, and unwilling to participate. The questionnaire was scored on a Likert scale (1=strongly disagree, 2=disagree, 3=neutral, 4=agree and 5=strongly agree).

The data was analysed using IBM SPSS version 26 (SPSS v26.0; IBM, Armonk, NY, USA). The respondents who fulfilled the criteria were recruited into the study. The data were computed in SPSS to identify teachers' knowledge, attitude, and practice towards visual impairment and visual rehabilitation. For each domain, scores were grouped into 'poor' and 'good' categories. For Knowledge, scores of 0-35 were categorised as poor knowledge and scores of 36-70 as good knowledge. For Attitude, scores of 0-23 were categorised as poor attitude and 24-45 as good attitude. As for practice, scores of 0-25 were categorised as poor practice and 26-50 as good practice.

Chi-Square test and odds ratio were used to determine the association between categorical variables. The association was tested at 95% confidence interval. Statistical significance level was set at $p < 0.05$.

Results:

The majority of respondents were female (75.3%), aged between 44 to 53 years old (37.8%) and had a bachelor degree as their highest level of education. There were 95.8% of respondents who had not undergone any formal low vision training program; as such only 13 teachers had undergone low vision training course [Table 1].

Table 1: Socio-demographic characteristics of participants *(n=384).*

Characteristics		Value	
		N	%
Gender	Male	95	24.7
	Female	289	75.3
Ethnic	Malay	338	88.0
	Indian	9	2.3
	Chinese	14	3.6
	Others	23	6.0
Age Group (years old)	24 – 33	76	19.8
	34 – 43	114	29.7
	44 – 53	145	37.8
	54 – 63	49	12.8
Education level	Diploma	23	6.0
	Bachelor	352	84.6
	Master	36	9.4
School location (States)	Perlis	3	0.8
	Kedah	23	6.0
	Pulau Pinang	3	0.8
	Perak	7	1.8
	Selangor	38	9.9
	Negeri Sembilan	9	2.3
	Melaka	5	1.3
	Johor	75	19.5
	Pahang	41	10.7
	Terengganu	45	11.7
	Kelantan	54	14.1
	Federal Territory Kuala Lumpur	37	9.6
	Federal Territory Putrajaya	5	1.3
	Federal Territory Labuan	3	0.8
	Sabah	27	7.0
	Sarawak	9	2.3

Table 2: Teachers knowledge, attitude and practice towards visual impairment and visual rehabilitation.

	Questions	*Responses (n = 384)*				
		Strongly Disagree	*Disagree*	*Neutral*	*Agree*	*Strongly Agree*
A1	Low vision and blindness are categorised as visual impairment.	13	27	56	205	83
A2	Low vision people have better vision than blind people.	18	19	39	199	109

A3	Blind people have light perception only.	23	45	114	147	55
A4	Cataract can cause blindness.	18	22	71	192	81
A5	Visually impaired students need magnification aids such as handheld magnifier and spectacle magnifier.	25	24	61	200	74
A6	Refractive error is the major cause low vision.	18	41	108	174	43
A7	All low vision students need a Braille.	23	57	111	138	55
A8	Contrast, Bold and Brighter of the reading material is importance for teaching the visually impaired students.	19	27	152	129	57
A9	Visually impaired students need magnification aids to see better.	21	27	84	185	67
A10	Blind students use auditory and tactile modes such as Braille for their learning needs.	18	16	42	178	130
A11	Reading too close is harmful to visually impaired students.	21	60	148	120	35
A12	Blindness can be inherited.	59	95	140	71	19
A13	All visually impaired students need extra attention and care.	17	17	47	191	112
A14	Visually impaired students must be registered as persons with disabilities at the Department of Social Welfare.	18	23	38	149	156
B1	If I were given a chance to teach visually impaired students, I will do it.	26	75	141	109	33
B2	If my student has difficulty to see at distance and near, I should advise them to seek for eye exam.	14	16	25	137	192
B3	I will encourage the visually impaired students to be placed in the same class with normal students.	89	126	70	75	24
B4	I am aware that visually impaired students can learn and manage themselves independently.	12	28	67	195	82
B5	I like to surf website to get the latest information regarding visually impaired students.	13	50	107	171	43
B6	Visually impaired students need support and motivation from the teachers.	13	13	27	133	198
B7	I will try to fulfill the needs of each student depend on their situation.	13	15	40	183	133

B8	I feel more confident to teach the visually impaired students by using visual aids.	12	21	51	181	119
B9	All teachers should have general knowledge about visually impaired students.	18	23	38	149	156
C1	I need experience and extra knowledge in order to teach visually impaired students.	15	8	28	166	167
C2	I need a formal training for teaching visually impaired students.	16	9	35	153	171
C3	I will ensure that visually impaired students will have extra attention than normal students.	16	16	25	193	134
C4	I update myself with the latest technology that might require by visually impaired students.	15	23	96	156	94
C5	I speak and write while teaching.	17	12	24	197	134
C6	I used teaching aids (demonstration and projector) for different kind of students which depend on their abilities.	18	14	51	201	100
C7	I will make sure a good lighting and environment in the class.	18	10	25	177	154
C8	I always update the academic performance each of the students to their parents.	17	16	43	214	94
C9	I able to control my emotion when dealing with visually impaired students.	20	10	98	181	75
C10	I always discuss and refer to other teachers how to improve my teaching style in order to become more effective.	19	11	35	198	121

*A: Knowledge, B: Attitude and C: Practice.

Out of 384 respondents in the study, 92.4% had good knowledge of visual impairment and visual rehabilitation, 92.7% had a good attitude and 93.5% had good practice towards visual impairment and visual rehabilitation [Table 3].

Table 3: Percentages on level of knowledge, attitude and practice towards visual impairment and visual rehabilitation among teachers in Malaysia.

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Variables	**N**	**%**
Knowledge:		
Poor	29	7.6
Good	355	92.4
Attitude:		
Poor	28	7.3
Good	356	92.7
Practice:		
Poor	25	6.5
Good	359	93.5
Total	384	100

Table 4: Knowledge, Attitude and Practice scores of each domain.

Indicators	Median (IQR)	95% confidence interval	
		Lower bound	Upper bound
Knowledge	52 (8)	49.61	51.62
Attitude	35 (6)	32.89	34.21
Practice	40 (8)	39.19	40.88
Total	128 (16)	122.00	126.39

The odds of having good knowledge towards visual impairment and visual rehabilitation among teacher who had undergone a low vision training were 3.00 (0.81-11.33) times higher than those of teachers with poor knowledge, after adjusting for level of education, teaching experience and age group, with p>0.01 [Table 5].

The odds ratio of teachers reporting good practice towards visual impairment and visual rehabilitation is 4.8 times more than teachers with low vision training (95% CI: 1.43-15.94, p<0.01). Similarly, the odds of teachers with good knowledge having a positive attitude towards visual impairment and visual rehabilitation were 73.00 (26.55-200.96) times those teachers with poor knowledge with p<0.01 [Table 6].

The association of practice towards visual impairment and visual rehabilitation among teachers in Malaysia was found to be significantly associated with teachers who had low vision training and good knowledge with p<0.01. The odds ratio of teachers having good knowledge, 81.40 (28.20-234.68) is greater than the teachers who have low vision training, 5.50 (1.64-18.55) [Table 7].

Discussion:

The findings revealed that most teachers in Malaysia have good knowledge, attitude, and practice towards low vision children, which is more than 90%. Good knowledge is crucial for teachers in general and special schools to teach and guide students with low vision. Good knowledge can help teachers to adjust the academic requirements so that the low vision children can learn along with their normal sighted friends. A good attitude reflects teachers insight into their students' condition. According to de Verdier & Ek (2014), visually impaired students experience frequent fatigue and take a longer to manage certain tasks. Next, despite having no formal training in low vision course, most teachers reported good practice in managing low vision children. Verdier and Ek (2014) also reported that several teachers in their study had insecurities and concerns about the appropriate way in teaching and evaluating students with visual impairments since improper teaching guide can affect the children's grade. However, in this study, teachers showed good knowledge and attitude, specifically confidence and courage in teaching low vision children.

Table 5: Association of education, teaching experience, age group and low vision training with knowledge towards visual impairment and visual rehabilitation among teachers in Malaysia.

Factors	Knowledge		Adjusted analysis	
	Good n(%)	Poor n(%)	OR (95% CI)	*p*-value
Education				0.157
Diploma	23 (6.0)	0 (0.0)	1.087 (1.055-1.121)	
Bachelor/Master	332 (86.5)	29 (7.6)		
Teaching experience				0.880
<15years	152 (39.6)	12 (3.1)	0.943 (0.437-2.033)	
>15years	203 (52.9)	17 (4.4)		
Age group				0.893
Lower age	176 (45.8)	14 (3.6)	0.949 (0.445-2.025)	
Higher age	179 (46.6)	15 (3.9)		
Low vision training				0.083
Yes	13 (81.3)	3 (18.8)	3.036 (0.813-11.331)	
No	342 (92.9)	26 (7.1)		

Table 6: Association of education, teaching experience, age group and low vision training with attitude towards visual impairment and visual rehabilitation among teachers in Malaysia.

Factors	Attitude		Adjusted analysis	
	Good n(%)	Poor n(%)	OR (95% CI)	p-value
Education				0.165
Diploma	23 (6.0)	0 (0.0)	1.084 (1.052-1.117)	
Bachelor/Master	333 (86.7)	28 (7.3)		
Teaching experience				0.987
<15years	152 (39.6)	12 (3.1)	1.007 (0.463-2.190)	
>15years	204 (53.1)	16 (4.2)		
Age group				0.737
Lower age	177 (46.1)	13 (3.4)	0.876 (0.405-1.895)	
Higher age	179 (46.6)	15 (3.9)		
Low vision training				0.005
Yes	12 (75.0)	4 (25.0)	4.778 (1.432-15.940)	
No	344 (93.5)	24 (6.5)		
Knowledge				<0.001
Good	346 (97.5)	9 (2.5)	73.044 (26.550-200.964)	
Poor	10 (34.5)	19 (65.5)		

Table 7: Association of education, teaching experience, age group and low vision training with practice towards visual impairment and visual rehabilitation among teachers in Malaysia.

Factors	Practice		Adjusted analysis	
	Good n(%)	Poor n(%)	OR (95% CI)	p-value
Education				0.192
Diploma	23 (6.0)	0 (0.0)	1.074 (1.045-1.105)	
Bachelor/Master	336 (87.5)	25 (6.5)		
Teaching experience				0.893
<15years	153 (39.8)	11 (2.9)	1.058 (0.467-2.395)	
>15years	206 (57.4)	14 (3.6)		
Age group				0.571
Lower age	179 (46.6)	11 (2.9)	0.790 (0.349-1.787)	
Higher age	180 (46.9)	14 (3.6)		
Low vision training				0.002
Yes	12 (75.0)	4 (25.0)	5.508 (1.635-18.550)	
No	347 (94.3)	21 (5.7)		
Knowledge				<0.001
Good	348 (98.0)	7 (2.0)	81.351 (28.200-234.681)	
Poor	11 (37.9)	18 (62.1)		

This study also explored how teacher's demographic characteristics affect their knowledge, attitude and practice towards visual impairment and visual rehabilitation. It is showed that there is no significant association between knowledge, attitude and practice with the teacher's level of education ($p>0.01$). This resonates with Hsu & Chen's (2018) study that showed that qualifications did not seem to cause substantial differences.

No significant associations were found between age and knowledge, attitude and practice among teachers. Hsu and Chen (2018) relates this lack of association significant to teachers of any age having similar experiences with technology. In this study, the knowledge of technology is beneficial in assisting students with visual impairment. There are many advantages of technology such as aiding teachers in delivering their teaching materials efficiently and

enabling sharing of information globally. Web-based materials have several strengths: Appeal and motivation, consistent content, current and evidence-based context, convenience and accessibility (Smith & Tyler, 2011). Smith and Tyler (2011) mentioned the benefits of Web-based materials to the person with visual disabilities. For instance, it can convert the text portions of Web-based material to a larger print or translate it to print braille or voice output, and transform both font and background to high contrast colour. Similarly, Abner and Lahm (2002) revealed that there are a few technologies that have assisted the visually impaired people in their daily lives, for example, optical scanners, closed circuit television systems (CCTVs), optical magnifiers, note-taking devices and technologies that produce large print, braille or speech.

Lastly, teachers who have attend low vision training showed a significant association with good knowledge, attitude and practice. Likewise, Rahman et al (2011) stated that positive attitude is evident among teachers who had training. Positive attitudes facilitate teaching effectiveness in the classroom, classroom management, evaluation procedures, assignments, and developing human relationships with students, principal and society in general. The key findings of this study justify that teachers should be given formal training on how to engage low vision students. Only with proper training can teachers be able to fully utilise low vision aids and teach student how to use the low vision aids as a way of visual rehabilitation. The primary aim of visual rehabilitation is to improve the quality of life of children with low vision by developing their visual perception and maximise the use of their existing sight by using appropriate methods to achieve an optimum vision so that the children can receive a proper education and adapt to social contexts (Ganesh et al., 2013). Moreover, early visual rehabilitation is crucial since it can decrease the impairments associated with the visual output and lower the risk of developing serious learning disabilities. The complications of early visual impairment includes profound functional and psychological consequences. Thus, in order to improve the vision of the visually impaired person, it is suggested to provide low vision devices (LVDs) along with lamps and reading stands, writing guides, bold-lined note books and large printed books as non-optical devices of LVDs (Ganesh et al., 2013).

The limitation of this study it is time-consuming as it requires the response from teachers around Malaysia which is quite challenging to engage, especially during this Pandaemic era. As for future research, the participant's demographic data in the questionnaire should ask the teachers whether they were from general or special schools to perform an association between types of school that the teachers taught with knowledge, attitude, and practice towards impairment and visual rehabilitation.

Conclusion:

This study determined that the teachers in Malaysia require formal training regarding low vision since some teachers are still not able to provide effective teaching assistance to visually impaired students despite having a high percentage of good KAP. This may warrant the need to include low vision courses in the teacher's academic syllabus. With a comprehensive education, the teachers can further understand their role whenever they encounter visually impaired children. Thus, this study could benefit the education system in both curriculum and co-curricular, primarily for visually impaired children since they need special education to be independent and successful inside and outside the school.

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