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Training Eye Care Providers in Glaucoma Screening: A Qualitative Study

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Abstract

Glaucoma is the second leading cause of blindness worldwide which can affect the quality of life. As glaucoma is asymptomatic, it is harder to detect than other eye diseases. Training eye care providers for screening of glaucoma may help in detecting glaucoma effectively. The purpose of this study was to seek the opinion of stakeholders on training of eye care providers on glaucoma screening and identify the components needed in the training course. Semi-structured interviews with nineteen eye care professionals were conducted. The interviews were audio-taped, transcribed and analyzed using thematic analysis. Three themes were identified: "Importance of training eye care providers in glaucoma screening", "Barriers which may encountered during training and "Components needed for the training". In theme "components needed for the training", three subthemes were identified which were "Methods of training", "Content for training material", "Accessing glaucoma screeners competency and accreditation". Barriers identified in training eye care providers were limited time to attend training, high turnover and low level of expertise. Overall, eye care professionals showed support toward training in glaucoma screening. The study indicated a number of key components that can be used to develop a training course for glaucoma screening in Malaysia.

Keywords: Glaucoma, glaucoma screening, training, eye care providers, training course

1. INTRODUCTION

Glaucoma is a progressive eye disease that causes the damage of the optic nerve which is vital for good vision. (Weinreb, Leung, Crowston, J, et al, 2016). According to the World Health Organization (WHO) in 2002, glaucoma is the second cause of blindness worldwide (Resnikoff et al. 2004). About 4.5 million people were estimated to be blind from glaucoma which is more than 12% of global blindness **(**Quiley &Broman, 2006**).** The number of individuals with glaucoma worldwide in 2013 was 64.3 million and this number has been predicted to increase to 111.8 million in 2040 (Tham, Li, Wong, Quiley, Aung & Cheng, 2014). In Malaysia**,** the National Eye Survey II (NES 11) conducted in 2014 reported that the prevalence of blindness caused by glaucoma was 6.6% among those aged 50 years and above (Mustari, MA, Hussein, 2015).

Screening of glaucoma usually in the form of opportunistic case finding in the clinics or population-based screening (Momont & Mills, 2013). Population based screening is usually conducted in the form of glaucoma awareness programme or community screening programme which offer free screening to the public (Momont & Mills, 2013). While, opportunistic case finding consists of screening of individuals who come for routine eye examination in the clinics by the eye care providers (Momont & Mills, 2013). A literature review on glaucoma screening found that opportunistic case finding was the better approach for glaucoma screening in the developed

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country where those who were suspected of glaucoma will be referred to eye clinics (Momont & Mills, 2013). However, the numbers of patients visiting eye clinics increased every year leading to patient overload in existing packed clinics. This is demonstrated by the Malaysian National Eye Database report in 2010 that found the number of patients visiting eye clinics increased from 365685 in 2002 to 735085 in 2010 where new cases increased about 59918 within this years (Salowi,M.A, Goh, 2010). This includes the number of new cases referred by the health clinics and general practitioner. Unnecessary referral to eye clinics will increase workload for ophthalmologists especially in government hospitals.

Eye care providers such as optometrists, nurses, medical assistant and ophthalmic technicians in hospital or private retail settings usually are the first contact with the patients before presenting to the ophthalmologists. They performed eye examinations such as vision taking, refraction, fundus examination using fundus camera, and other examinations depending on the equipments available in their practice. In Malaysia, optometrists acquire skills for detection and referral of glaucoma during their four years undergraduate study (Hussin, Hendicott, Carkeet, et al., 2018). However, their skills are not fully utilized as they are mainly involved in refraction in their practise (Hussin, Hendicott, Carkeet, et al., 2018). Almost all eye departments especially in government hospitals usually have their own in-house training for their nurses, optometrists, ophthalmic technicians and medical assistants on specific ophthalmology skillls.

Role of eye care providers varied across different countries. In the United Kingdom, there are shared care pathways for glaucoma which involve accredited community optometrists or nurses (Vernon, Stephen & Adair, 2009). They refined referrals for those who were suspected to have glaucoma to reduce burden to the glaucoma clinic and monitored the patients who already diagnosed with glaucoma, suspected glaucoma and ocular hypertension. These optometrists or nurses were trained in accredited glaucoma courses such as a Glaucoma Professional Certificate, Higher Professional Certificate or Glaucoma Diploma before they are allowed to take part in the refinement scheme (Keys, 2018). This shared care pathway was established to reduce the workload for glaucoma specialists and waiting hours for appointments (Glesson, 2013).

Ministry of Health (MOH) Malaysia has developed and implemented a diabetic screening training programme for eye care providers. However, there is no established formal glaucoma screening training programme established in Malaysia. A study reported that additional training for eye care providers is required for specialisation in glaucoma (Myint, Edgar, Murdoch & Lawrenson, 2014). Therefore, it is important that eye care providers have the knowledge and skills in conducting glaucoma screening.

This study is a part of a larger study on development of a training module for glaucoma screening. Hence, this study's aim was to explore the perception of the stakeholders on training of eyecare providers in glaucoma screening and identify the components needed in the training course. This study will contribute to development of training module for glaucoma screening in Malaysia.

2. METHODS

2.1 Recruitment of participants

Eye care professionals such as ophthalmologists, optometrists, ophthalmic technicians, nurses and medical assistants from selected Ministry of Health of Malaysia and university teaching hospitals were recruited for this study. Participants were chosen using a purposive sampling until saturation was achieved. However, snowball sampling was used to recruit ophthalmic technicians in this study. This study was approved by the Medical Research Ethics Committee, Universiti Kebangsaan Malaysia (UKM) PP1/111/8/JEP-2020-127. All the participants were contacted through telephone to arrange for an appropriate time for the interview and informed consent was signed prior to taking part in the study.

2.2 Data collection and analysis

Semi-structured interviews were conducted with 19 eye care professionals from April to June 2020. All of the interviews involving ophthalmologists and optometrists were conducted via online teleconference software such as Zoom, Cisco Webex, and Skype due to restriction of the subject movement during the Movement Control Order (MCO) implemented in Malaysia in March 2020. However, interviews involving the medical assistants, ophthalmic technicians and nurses were conducted in their respective clinics at Sentul Health Clinic and Ophthalmology Clinic, Hospital Canselor Tuanku Muhriz Universiti Kebangsaan Malaysia Medical Centre (HCTM UKMMC). These latter interviews took place in June 2020, during the Recovery Movement Control (RMCO) where the movement was not so restricted.

Interviews were conducted by the investigator (WXH) using a topic guide regarding their opinions about training in glaucoma screening, components of training course for glaucoma screening and factors associated with successful implementation of the training course. Open-ended and probing questions were used to encourage participants to talk freely and express their opinion on the subject. Ten of the interviews were conducted in English. The rest of the interviews were conducted in Malay language due to the request of the participants who felt more comfortable speaking in their native language.

All the interviews were audio-recorded with a tape recorder. Subjects consented for the interviews to be recorded before conducting the interview. The audio tapes of interviews that were conducted in English were transcribed but interviews conducted in Malay language were translated into English first. Data was entered into NVivo qualitative data analysis software version 12 (QSR International, USA). Thematic analysis (TA) was used to analyze the data acquired from the interviews. The technique involved a systematic process of familiarization, identification of a thematic framework (the key issues and themes), indexing (systematically applying the framework to the data), charting, mapping and interpretation. The first author analyzed the transcripts and co-authors of the study verified the themes.

3. RESULTS

Nineteen eye care professionals were recruited for this study which consists of four ophthalmologists, six optometrists, five nurses, three ophthalmic technicians and one medical assistant. Majority was women (12, 63%). Most of them were Malay (16, 84.2%), Chinese (2, 10.5%) and Indian (1, 5.2%). The age of participants ranged from 29 years old to 61 years old with the means of 41.5.

Three themes were identified from the interviews, Theme 1**:** "Importance of training eye care providers in glaucoma screening", Theme 2: "Barriers which may encountered during the training" and Theme 3: "Components needed for the training". Within Theme 3, three sub themes were identified which include "Methods of training", "Content for training material", and "Accessing glaucoma screeners competency and accreditation".

3.1 Theme 1: Importance of training eye care providers in glaucoma screening

The participants were asked about their opinions on the importance of training eye care providers for glaucoma screening. Majority of the participants agreed that training eye care providers in glaucoma screening was important to reduce unnecessary referral to eye clinics. Participants added that the eye care providers also need training so that they increase their knowledge to improve their service to the community.

> *"I agree with you that there's a lot of unnecessary referral. That's why training is very important. You see optometrist training is very important. In coming AOC (Asia Optometric Congress) in November because of the COVID, I'm not sure whether will be postponed or not. I suggest we have two major skill transfer. One is asking the ophthalmologists to teach us fundus identification of glaucoma. This is presented in a workshop that the optometrists must passed this in order to be award a certification. Another course that can be run by the ophthalmologists is diagnosing of glaucoma using OCT. That's why I said that upgrading knowledge is very important. We even have a recent study. Right? The study was about trainee ophthalmologists failed to diagnose glaucoma based on the fundus assessment, because they are also very weak not to mention, optometrists are very weak. So that's why we need to be trained. It is very important. Once we are more competent, we can provide a better referral to the ophthalmologist"*
>
> [Optometrist 2]

3.2 Theme 2: Barriers which may encountered during the training

Participants were asked about the personnel that should be trained for glaucoma screening. Majority felt that optometrists are suitable for training in glaucoma screening compared to other eye care providers. A few barriers of training eyecare providers apart from optometrists were identified.

One of the barriers was time for attending training may be restricted. Attending training courses may be challenging for nurses, ophthalmic technicians and medical assistants as they have other responsibilities in the eye clinics.

> *"Well, I think that training eye care providers such as nurses, ophthalmic technicians and medical assistants actually have their role already within the hospital which I think does not allow them to have undergo full training in addition to do this job outside of their job scope. So, I personally don't think they need extra training unless whereas optometrists they have those who worked in hospital and you have those that in community. So, they can undertake the training to take part into either in organizing a screening event or do opportunistic screening."*
>
> [Ophthalmologist 3]

High turnover of eye care providers in the clinic is also a barrier in training nurses, medical assistants, and ophthalmic technicians. They may be transferred to another speciality clinic. It is not cost effective to train them as compared to optometrist who will stay in the clinic.

> *"Yes, historically we have tried for 20 to 30 years to train nurses, paramedics to screen for eye diseases I would like to tell you that it is not cost effective because number one, they have to multi task in a lot of other diseases. Number two, high turnover rate, ok. Number three, the ability for us to train them is limited because of their basic knowledge is nowhere the level of optometrists is. That three problems, So now let say you train paramedic A, B, C, D and E. And you put him in community setting. Very often he will be at that setting for maybe one two three years and he will be rotated to another clinic or will be transferred out or will be promoted. His efficiency as a screener will no longer becomes effective. High turnover whereas optometrist will always be there, will always practicing wherever he goes and his knowledge will stay with him because eye care is a core part of his practise"*
>
> [Ophthalmologist 2]

Another barrier identified is the knowledge and skills of nurses, medical assistants, and ophthalmic technicians may not be as good as an optometrist. It will take longer time to teach them as their level of knowledge is low compared to an optometrist.

> *"Well, to a certain extent, but eye care providers such as ophthalmic technicians, nurses and medical assistants will never reach the expertise that optometrists are capable of, because if you look at their level of expertise, the exposure, the exposure to, for example, anatomy and physiology, as well as knowledge of the disease. No way it comes near the level of the knowledge of an optometrist. Okay, that level, as you know, again, access to the equipment, optometrists, for example, learning how to do perimetry. What the optometrists would be able to get in after training of maybe two weeks, maybe a month. Whereas if you were to train all these other paramedical staff, it may take, what, three months, six months and even after that, they would never reach the level of expertise that optometrist could possibly achieve. Okay? Because you must remember when you're screening for glaucoma, and if you are doing things like perimetry the interpretation of those results, whether it's perimetry or even fundus photography is very crucial to the subsequent steps that need to be taken in glaucoma. Okay, it's not just it's not as simple as taking blood pressure, you've got normal value and okay and you can say you send the patient off for treatment if that normal value so it's not like that in glaucoma"*
>
> [Ophthalmologist 2]

3.3 Theme 3: Components needed for the training

Three sub themes were identified under this theme which are "methods of training", "Content for training material", and "Accessing glaucoma screeners competency and accreditation".

Subtheme 1: Methods of training

Majority of the participants expressed that both theory and practical training should be incorporated in the training course.

> *"The workshop is the main thing you want to skill transfer is very important. I think make it like a workshop not so much with the lectures, we give that workshop to translate the skill to optometrists"*
>
> [Optometrist 2]

"Practical and theoretical has to combine. Let's say you make 1 hour theory and 1 hour practical".

[Optometrist 1]

In addition, clinical attachment to the glaucoma clinics is another method to consolidate the knowledge and skills of the course participants.

"*Kind of student master attached to the ophthalmology clinic is enough, make a log book"*

[Optometrist1]

"I think some of the medical assistant has to come for a training with us the glaucoma specialist. It is possible but it will take longer time than compared to train paramedic for the diabetic screening. It can be done but I'm not sure how we're going to do it. How the paramedic will accept the training. I mean it's not that easy."

[Ophthalmologist 4]

There were different opinions about training hours for the program. Suggestions varied from one day to three months of training. One of the participants suggested to follow the training hours of the current diabetic retinopathy screening module by the Ministry of Health Malaysia.

"I think if I wanted to do glaucoma screening training, it would be in two days"

[Optometrist 6]

"A whole day of training, maybe is about in a day, working hours about eight hours. I think a whole day course"

[Ophthalmologist 4]

"At least maximum 3 months. Short course. At least 3 months."

[Nurse 1]

"Well, I don't know. I am not sure, I probably refer to the training module that they have done for diabetic retinopathy screening. So perhaps follow that training hours"

[Ophthalmologist 3]

Subtheme 2: Content for training material

Majority of the participants suggested that optometrists should be trained on detecting and diagnosis of glaucoma while the other eye care providers such as medical assistants, nurses and ophthalmic technicians should be trained to perform clinical examinations required for diagnosis of glaucoma such as fundus photography.

"As I mentioned, they can be trained to assist the optometrists probably to conduct the examination, but the diagnosis of the data should come from a properly you know qualified person which will be the optometrist or ophthalmologist"

[Optometrist 4]

"Nurses, ophthalmic technicians and medical assistants can be trained in taking optic disc photographs"

[Ophthalmologist 1]

However, there were different point of view regarding training of the eye care providers excluding optometrist on

detecting and diagnosis of glaucoma. Some of the participants suggested all eye care providers can be trained on detecting and diagnosis of glaucoma as they have the knowledge to operate the required instruments for glaucoma screening such as fundus camera.

> *"Well, it is possible but you have to test their ability to. That's only one area in which they may play a role. Okay at this point in time at where they done the fundus photography where there is potential for them to be trained to detect optic nerve changes. If they are trained for that there is a potential for them to be able to pick up cases"*
>
> [Ophthalmologist 2]

Most of the participants agreed that the content of the training module should include introduction to glaucoma, epidemiology of glaucoma, signs and symptoms of glaucoma, risk factors for glaucoma, anatomy and physiology of the eye, pathogenesis of glaucoma, diagnosis of glaucoma, management of glaucoma, basic knowledge on equipment, instructions on operating instruments such as fundus camera, automated perimetry and tonometer. Participants also agreed that history taking and visual acuity test is also important for the training module.

> *"Usually the training depends on who you are. First, I said the introduction and a bit about the epidemiology second lecture is the diagnosis, history, examination and investigation. depends on who the target audience are"*
>
> [Ophthalmologist 2]

> *"Well, apart from understanding the basic pathophysiology of glaucoma, knowing the risk factors, epidemiology of glaucoma, they should also understand the instruments that are used to diagnose intraocular pressure and what their limitations are"*
>
> [Ophthalmologist 4]

Subtheme 3: Accessing glaucoma screeners competency and accreditation

Majority of the participants expressed that accreditation can be given after the eye care providers are assessed as competent at the end of the training.

> *"I think if you have proper training and assessment at the end of it for them to be certified. Certification maybe last for two years and then they undergo further assessment to renew perhaps their qualification"*
>
> [Ophthalmologist 4]

There were mixed opinions on the exam to access the competency of the eye care providers. Some suggested that the exam should include both theory and practical exam.

> *"Need to do two tests one is the practical and then second one is the written test. So, for screeners there should be a session on how they perform the examinations like the fundus and tonometry. For the optometrists practically, they need to be tested by you know by giving case studies and answer the case orally"*
>
> [Optometrist 5]

However, some of eye care professionals pointed out that only theory exam is needed to assess the skills of the eye care providers especially assessment of optic disc.

> *"I think it can be like a theory exam. But perhaps with pictures. Ophthalmologist have adequate pictures. Pictures that should be enough. I think that should be enough. That in the term of practical it should be enough to provide the main skills really. IOP is just something you read it from the machine but assessment of optic disc is that something that need sort of learning you know on how to assess that"*
>
> [Ophthalmologist 3]

"Number one, I think you can have a case study and see whether they can pick it up or not, you can show pictures of the ,can show picture of retina and show picture of anterior segment of the eye, multiple picture and grade them see whether they can do it or not"

[Optometrist 6]

"Pre and post-test"

[Nurse 2]

There are different opinions about practical exam. Some of the participants felt that practical exam should include performing skills on real patients and diagnose whether the patient has glaucoma or not. One of them suggest OSCE test to test the competency of eye care professionals in glaucoma screening. Other participants pointed out that practical exam for medical assistants, nurses and ophthalmic technicians should involve performing examination such as fundus photography and tonometry on real patients.

"Maybe we can give glaucoma patients and need them to check the patient from beginning to end. And then present the test result and diagnosis"

[Ophthalmic technician1]

"*OSCE, written test like that. We can determine we have that skill. And then we finish the course we are qualified to diagnose."*

[Nurse1]

"So, for screeners, there should be a session on how they perform the examinations like the fundus and tonometry"

[Optometrist 5]

One of the participants stressed that training module for glaucoma screening is difficult to be accredited if the participants were medical assistants, nurses and ophthalmic technicians.

"No one have developed an accredited module yet unlike for diabetic retinopathy. Simply because if you want to depend on fundus photography ok it is not recognised as a reliable detection method on its own. Although you can train them, it would be difficult for that training to become accredited or acceptable unlike diabetic retinopathy because diabetic retinopathy in in that fundus photography where you have all the parameters you need whereas in glaucoma you can't. So it become very hard to accredit them. You can do in informal stance but it is very difficult to give accreditation unlike optometrist"

[Ophthalmologist 2]

However, he felt that accreditation of training course in glaucoma screening can be given for optometrist who currently undertaking the Master of Clinical Optometry.

"Ok for that at least to become that they should undergo Master sort of training. That will be the ideal. I would think because the Master has limited seat. For the interim period my idea is to give 6 months of certification process until the Master can reduce enough experts in glaucoma. I think if we train optometrists for 6 months it could already play a role as accredited community optometrist in glaucoma "

[Ophthalmologist 2]

4. DISCUSSION

This study was to our knowledge is the first study to explore the opinion of eye care professionals about training in glaucoma screening in Malaysia. The participants in our study agreed that training in glaucoma screening should be conducted among eye care providers to reduce unnecessary referral to eye clinic. This result was similar to previous studies in the UK that reported that optometrists who were trained in detection of glaucoma could reduce the first visit discharge rate of patients by 22% by comparing referrals from non-specialist optometrists and specially trained optometrists in glaucoma to hospitals (Ratnarajan et al., 2013). Gunn et al. reported that false-positive rate within Manchester Glaucoma Enhanced Referral Scheme which involved accredited optometrists

was 15.5% (Gunn et al., 2019). These studies showed that training in glaucoma screening was essential to reduce burden to the eye clinic.

Our results also showed that participants felt that training is needed to improve their knowledge in detecting glaucoma. Our results were supported by an evaluation study on the impact of training on community optometrist in Ireland which found that most of the optometrists felt that the training had improved their ability and confidence to detect glaucoma (Black, McClelland & Richardson, 2017). A survey conducted among 199 optometrists in Ireland reported that 71% of optometrists felt that they need extra training in eye examination technique to detect glaucoma (Barret & Loughmann, 2018). Another study in the United Kingdom also reported that majority of the accredited community optometrists felt that their ability to detect glaucoma had improved especially in the detection of false-positive cases after attending training course (Konstantakopoulou et al., 2014).

Our study identified several barriers that may be encountered in training eye care providers apart from optometrists. The barriers identified were limited time to attend training, high turnover of staff and their knowledge and skills may not be as good as optometrists. A report by The Royal College of Ophthalmologist in 2017 reported some ophthalmologists felt that training of eye care providers, especially nurses was labour extensive as the turnover is high (The Royal College of Ophthalmologists, 2017). They also mentioned that the nurse's ability to learn was not as good as an optometrist (The Royal College of Ophthalmologists, 2017). They also found that nurses who were trained to be glaucoma nurse practitioner unable to work independently unlike optometrists (The Royal College of Ophthalmologists, 2017**)**. Hence, most of them had recruited optometrists as optometrists are already familiar with examinations for glaucoma detection (The Royal College of Ophthalmologists, 2017**)**.

Another method that may solve the problem of limited time to attend training may be e-learning such as online lectures and video instructions instead of traditional classroom learning. Currently, in Malaysia, majority of universities conducted lectures online via teleconference platforms such as Zoom, Microsoft Teams and others during MCO. Similar scenario has been found in all over the world during this pandemic, especially education in ophthalmology field (Wong & Bandello, 2020). E-learning may help eye care providers to attend lectures anywhere and at more convenient times while maintaining social distancing until an effective vaccine for COVID-19 is found (Chatziralli et al, 2020). Hence, eye care providers will able to access the training course when they have the time. However, the online platform is not sufficient for practical sessions. A recent study on online teaching of ophthalmic skills to medical students in a university in Hong Kong found that the students can follow the online clinical demonstration (Shih, Chan, Chen & Lai, 2020). However, they found that direct ophthalmoscopy technique was unable to be taught online as this skill needs contact with patients to practice (Shih, Chan, Chen & Lai, 2020). Therefore, proper coordination between e-learning and face to face learning should be established to address this problem.

The results indicated that optometrists should be trained in diagnosis of glaucoma while other eye care providers should be trained in operating the instruments. However, there were several studies which showed that medical assistants, nurses and ophthalmic technicians could detect glaucoma. A study in India which assessed the effectiveness of ophthalmic assistants in glaucoma screening found that level of agreement between ophthalmic assistants and ophthalmologists were moderate for diagnosis of glaucoma (Sinha & Astbury, 2011). The researchers also suggested that more extensive training of the ophthalmic technicians such as refresher courses can increase their ability to detect glaucoma suspect patients (Sinha & Astbury, 2011). Similarly, there was another study which compared the ability to detect glaucoma between nurses with a special qualification in glaucoma and ophthalmologists in the United Kingdom found that nurses able to screen for glaucoma (Munneke, Kingett, Byles & Smith, 2013). However, they also found that the number of referrals to eye clinic could be increased due to the nurses' tendency to over diagnose for glaucoma especially in optic disc assessment (Munneke, Kingett, Byles & Smith, 2013). Hence, the nurses may need more training in optic disc assessment to increase their effectiveness in detecting glaucoma.

Our study found that training course in glaucoma screening should incorporate both theory and practical. Some participants mentioned attachment to glaucoma clinic as part of the training course. Usually, a short training course does not need attachment to the glaucoma clinic. However, in a post-graduate training, placement of eye care providers in the glaucoma clinic are usually included in the training course. A recent study suggested that optometrists should be attached with ophthalmology clinic so that they can improve their knowledge as they will be exposed more to eye disease than in optometry practices (Barrett & Loughman, 2017). These suggestions are supported by evidence from Myint et al. study which showed that didactic teaching was not enough to improve clinical skills in detecting glaucoma (Myint, Edgar,Murdoch & Lawrenson, 2014). The authors suggested

developing more specialised post-graduate training which is more practical-based (Myint, Edgar,Murdoch & Lawrenson, 2014).

Training hours in glaucoma screening depend on how extensive the content of the training module. Some participants suggested that the training hours follow the training hours for the Ministry of Health of Malaysia diabetic retinopathy module which take two days of training (Ministry of Health, 2017). In the United Kingdom, training courses in glaucoma is usually in the form of post-graduate courses which have a longer training hour (minimum three months of training). Some training course took three days for training on diagnosis and management of glaucoma (Myint, Edgar, Murdoch & Lawrenson, 2014). Syam et al. study took around nine hours of practical session (three session) and nine hours of theory lessons for training optometrists in glaucoma (Syam et al. 2010).

The findings of the study found that the training module should include all the knowledge of glaucoma, instruction of the relevant operating instruments, diagnosis and management of glaucoma. Interpretation of the results of instruments is vital to detect glaucoma effectively. Glaucoma is different from diabetic retinopathy as more diagnostic devices are needed for more accurate diagnosis of glaucoma. Participants frequently mentioned fundus camera for glaucoma screening as eye care providers use them commonly in their practice. Hence, knowledge on how to operate fundus camera must be included in the module. The other instruments that should be included in the training module are tonometer and visual field machine such as Humphrey Visual Field. In western countries, eye care providers who completed the post-graduate course can participate in glaucoma referral refinement pathway. These post-graduate courses are more extensive and they include training in contact tonometry, slit-lamp binocular indirect ophthalmoscopy, optic disc assessment and anterior chamber assessment (Black, McClelland & Richardson, 2017).

Accreditation is essential to ensure clinical competency of eye care providers in glaucoma screening (Harper, Creer, Jackson, Ehrlich, Tompkin, Bowen & Tromans, 2016). Our study found that most participants agreed on practical assessment to test competency as the form of accreditation requirement. Our research also indicates post-graduate certification as one method of accreditation. These findings are very similar to what has been found previously in a survey conducted among 70 optometrists in the United Kingdom whom 87% of respondents preferred internal practical assessment as a method of accreditation for glaucoma training. Thirty five percent of respondents felt that method of accreditation should be the completion of a post-graduate certificate (Harper, Creer, Jackson, Ehrlich, Tompkin, Bowen & Tromans, 2016).

From this study, we have identified the components that are needed in the training course for glaucoma screening which is acceptable by eye care professionals. Further research may be required to investigate the necessity of development of training course in glaucoma screening as currently in Malaysia, there is no specialised training course for glaucoma screening. These findings also will provide additional information in the development of a post-graduate certificate in glaucoma in Malaysia in the future.
Limitation of this study is this study was conducted in Klang Valley. Hence, the results of our study may not represent the viewpoints of eye care professionals in the whole country.

CONCLUSION

This study showed that majority of eye care professionals felt that training in glaucoma screening needs to be implemented for eye care providers. The study also highlights components and barriers in implementing a training course in glaucoma screening for eyecare providers from the perspectives of stakeholders. The results from this study will helps in development of training course for glaucoma screening in Malaysia.
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