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"Optometrists Show Rudimentary Understanding of Evidence-Based-Practice but are Ready to Embrace It: Can Barriers be Overcome?"

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ABSTRACT

Background: Evidence-based practice (EBP) involves integration of the best available evidence from research, the patient's preferences or circumstances, the clinical environment and the health practitioner's expertise. There have been several qualitative studies of EBP in healthcare but to date none have focused on the profession of optometry. Therefore, the aim of the present study was to assess optometrists' perception of EBP in optometry.

Methods: This exploratory qualitative study employed focus group meetings and individual telephone interviews to gauge understanding of and opinions about EBP in a convenience sample of Australian and Saudi Arabian optometrists. Results were summarised in accordance with the Consolidated Criteria for Reporting Qualitative Research (COREQ) checklist. NVivo software was used for qualitative analysis of the results.

Results: Most participants were supportive of EBP, however, their perceptions did not generally reflect a deep understanding of the definition or process of EBP. Participants reported using a combination of low and high level evidence to inform their clinical decisions. In line with findings from other health professions, barriers included lack of time and lack of access to information whilst enablers such as education, organisational support and self-motivation were cited.

Discussion: Our findings suggest a need for better training of optometrists in EBP as well as resources and approaches that support EBP in optometry such as an EBP database of pre-appraised evidence and more secondary sources of evidence such as systematic reviews and critically appraised topics.

INTRODUCTION

Evidence-based practice (EBP) involves integration of the best available evidence from research, the patient's preferences or circumstances, the clinical environment and the health practitioner's expertise.[1] The process of conducting EBP involves the five steps of: asking answerable questions, searching for evidence, critically appraising evidence, making decisions, and evaluating outcomes.[2] Despite the apparent simplicity of the five-step process, EBP competencies, like many other clinical competencies, are highly complex in nature and consequently difficult to measure.[3]

Attitude towards EBP is a possible predictor of future EBP implementation behaviours in clinical practice.[4] Assessments of self-efficacy in EBP provide an understanding of an individual's self-ascribed confidence in his/her ability to perform EBP tasks and can be a strong predictor of the frequency with which the individual actually engages in EBP.[5] Now well established in medicine, EBP is also increasingly being embraced in a range of allied health disciplines, owing in part to its recognised importance in improving patient outcomes and cost effectiveness in everyday clinical practice.[6-9] Numerous studies have investigated health practitioners' understanding, attitudes, self-efficacy and barriers towards EBP in a range of healthcare disciplines. The majority of these studies have used qualitative or survey methods to gain an understanding of EBP attitudes, but relatively few of these studies have developed validated assessment tools[4,10] to measure EBP attitudes and self-efficacy.

The adoption and application of EBP in optometry has generated interest in recent years.[6,11-14] We have previously shown that after patient's history, symptoms and signs, Australasian optometrists primarily use information from undergraduate and postgraduate education as a basis for clinical decision-making.[12] However, to date no qualitative study has fully explored optometrists' understanding of and attitudes toward EBP. As described above, qualitative methodologies consisting of interviews and open-ended questionnaires have proven effective at garnering

information on EBP attitudes and self-efficacy.[15,16] Furthermore, some aspects of qualitative methodology provide the ability to probe deeper into certain questions and issues that arise during the course of an interview, thus potentially increasing the authenticity of the data collected.[17] The aim of the present study was to explore optometrists' perceptions of EBP in optometry.

METHOD

This exploratory qualitative study employed a combination of focus group meetings and individual telephone interviews. The study description and results are summarised in accordance with the Consolidated Criteria for Reporting Qualitative Research (COREQ) checklist.[18] A convenience sample of optometrists based and registered to practice in one of two locations, Australia and Saudi Arabia was chosen, based upon the authors' expertise and knowledge of optometry in both of these countries. This enabled exploration of perceptions of EBP in two different systems of optometric education and governance. Focus group meetings were conducted in Sydney, Australia and in Riyadh, Saudi Arabia. The focus group facilitators were registered optometrists with previous experience in conducting focus groups. To minimise bias, these facilitators were not involved in the research design, data transcription and/or analysis and were instructed to withhold the expression of personal views and opinions during the conduct of the focus groups.

Six open-ended questions were used to guide the focus group discussions (Table 1). These questions were based upon literature review and were reviewed by EBP experts trained and experienced in the administration of focus group studies. The questions were designed to elicit participants' (1) understanding of EBP, (2) attitude toward EBP (3) examples of EBP in action, (4) sources of evidence, (5) barriers to EBP and (6) enablers of EBP.

Sampling and participants

The sample size for this study was validated based on the 'saturation point' theory; i.e., when participants' responses began to reiterate the same answers, with no new topics or patterns emerging, no further respondents were engaged and fieldwork ceased.[17]

In Riyadh, Saudi Arabia, an email invitation was sent to a list of optometrists from the Saudi Commission for Health Specialties Database for Riyadh optometrists, which records details of all the qualified optometrists working in Riyadh. Two focus groups comprised of four participants each were conducted, in addition to one-to-one telephone interviews with two optometrists who were unable to attend the focus groups.

In Sydney, Australia, an email invitation was sent to a list of volunteer Australian and New Zealand optometrists who had previously participated in an online study and agreed to be contacted for future studies.[12] Six optometrists agreed to participate. Initially, one focus group meeting was held with attendance from three optometrists, and individual telephone interviews with three other optometrists were conducted.

The focus groups were conducted in September 2010 at the School of Optometry and Vision Science at the University of New South Wales in Sydney, Australia, and in January 2011 at the Eye Care Center in Riyadh in Saudi Arabia. All focus groups and interviews were conducted in English in both countries. The focus group discussions and telephone interviews were audio-recorded and transcribed anonymously by the current researcher, and by an additional experienced transcriber for verification. The duration of each focus group meeting was approximately 75 minutes and the telephone interviews approximately 20 minutes. All participants were provided with a Participant Information Statement and signed an Informed Consent Form prior to participating in the study. Details of the participants are provided in Table 2.

Data analysis

The focus group and interview transcriptions were uploaded into NVivo10 software (QSR International), which was then used to conduct qualitative analysis. Qualitative analysis was performed to deconstruct then reconstruct the data in a way that assisted the analytical process. This process included open coding, cross coding, re-organising, coding on, and writing analytical memos .[19-21] The analysis was undertaken by two investigators who independently coded and categorised the topics before these were discussed for the final analysis.

RESULTS

We report a straight description of the participants' views and a perspective of EBP, presenting the data in its original format using quotes. Based on participant responses, the following five topics were generated: (1) understanding of EBP; (2) examples of EBP; (3) sources of evidence; (4) significance of EBP; and (5) barriers and enablers of EBP. Country differences are highlighted whenever these occurred for example, in barriers and enablers of EBP (see Table 3). As there were no obvious systematic differences in the characteristics of the research across countries, the results were structured around topics. Analysis of the data from the Australian focus group meeting and telephone interviews appeared to suggest that saturation had been reached and further focus group or interview sessions were unlikely to generate new data.

Understanding of EBP

When asked to describe their understanding of EBP, most Saudi Arabian and Australian participants responded similarly, with the notion that EBP relies on published research, and that these publications often inform and underpin clinical decision making. As one Saudi Arabian (SA) participant explained with reference to how they learn about and implement EBP:

'There are plenty of studies worldwide [in the] field of eye health…and we try to use the conclusion of these studies to practice…with the [patients]'.

Other Saudi Arabian participants also explained that keeping up with current research is helpful in informing their clinical decisions and maintaining current medical standards. Even those who had not previously heard the term EBP felt that they were enacting practice that was based on evidence, such as referring to current, available evidence as much as possible. As one participant stated:

'I try to update myself…to read all the articles…to try to attend some of the symposiums (sic) …or anything that I can help with my clinic…but the term itself…for me it's the first time to think about it' (SA focus group).

Similarly, a number of Australian respondents defined EBP as the application of current research to their practice. As one participant commented:

'the course of action that I take after I've got my information from the patient's examination would be guided by research that has indicated that in a particular type of case management, a particular course of action is indicated' (AU interview).

One participant specified the type of evidence, which he described as "research-based information", that should in his or her opinion be used in EBP:

'I think evidence-based practice is…based on... randomized controlled studies, so if you do this, it provides an outcome, and not making decisions [based] on anecdotal evidence or possibilities or maybes' (AU Interview).

Others suggested that, to them, EBP is the combination of clinical experience and research-based evidence. For example one Saudi Arabian focus group participant explained that, in the context of their understanding of EBP, both professional experience and recent studies inform certain clinical decisions, such as contact lens selection:

'I know that [a] keratoconus patient should be treated with something like a hard contact lens, [but] which lens selection, this depends on my [clinical] experience, my research, [and] the recent studies' (SA focus group).

Similarly, one Australian respondent commented:

'There's no hard and fast rule because every patient is physically different, so to me evidence-based practice is… a combination of everything that occurs in scientific circles, the literature … combined with… (the) extensive library of experiences. To use your example of whether you patch a corneal erosion, for example… you could find scientific evidence one side or the other, equally you could find scientific evidence of both sides conflicting…and we're not only just analysing the data, we're… analysing the patient. So I would… argue that, to me, evidence based practice is… a combination of both what is written in science and what is stored up in our experience, the evidence coming from our own background.' (AU focus group).

However, one Australian interviewee stated that if the methods seem to help his/her patients then *'that's not evidence-based optometry but it's good enough for me.'* No other participants reported similar attitudes, but some discussed other factors in their decision-making that they considered to be important. One participant summed this up with *'good optometry is a combination of clinical experience and [research-based evidence]' (AU interview).*

Within the Saudi Arabian focus group, one participant also demonstrated poor understanding of EBP by stating that *'nothing comes close to experience, because during … [my] experience I have read, and I have tried it, and I know. And I have reached [a] level where experience plays a very important role.'* Nevertheless, s/he went on to elaborate that*: 'I am always learning,'* and that reading about research was considered part of his/her clinical practice, complementing experience.

Some Australian participants pointed out that there are times when the literature does not cover all situations, and that one cannot possibly read all the current literature. As one focus group participant explained:

'[It's] true to say that not everything that we come across appears in the literature, and it's also certainly true to say that… I might read my Clinical and Experimental Optometry and a few other things, and keep [abreast with] what's going on in the groundswell, but I do not read every optometry journal in the world.'

Interestingly, one participant felt that practitioners sometimes avoid EBP by devolving the care of difficult or unusual patients who are outside of their normal scope of practice:

'Depending on how actively you want to manage your patients, I guess some optometrists and I'm sure it's the same with medical practitioners, would have a patient … it doesn't fall within what they consider to be their scope of care, and so quickly will move them on to secondary or tertiary care. And so some practitioners probably solve their need to keep up to date on evidence-based practice by allowing someone else to manage [them].'(AU interview)

Interestingly, none of the participants mentioned the five-step process of EBP nor did they describe any of the individual components of this process.

Examples of EBP

This section presents data partially elicited from the interview question 'could you please give some practical examples of EBP or the types of evidence that you use in your practice?' The responses from Saudi Arabian and Australian participants were very similar. Most participants from both groups reported examples of how research persuaded them to modify their practice in some way. Some reported that it took a while to integrate EBP into their practice, but that good research was an important factor in updating procedures. Such examples highlight optometrists' rudimentary understanding of the meaning of EBP and their apparently poor grasp of the hierarchy of evidence. As one Australian participant reported:

'It took me a long time to start to change my thinking on …, because I'd been doing it for 20-odd years and it was like, hang on a sec, I've got lots of personal examples where I do believe it's worked. In fact, I've more evidence of that than what they could present to me that wouldn't work but, ultimately, I've come around to the thinking that I don't know more than these people (researchers), that they do present good data, that it has been done properly, and that it wasn't research done by anybody with a commercial interest' (AU focus group).

Participants gave examples that highlighted how they had used research to modify specific practices. For instance, one Australian participant used research to aid in diagnosis and referral to ophthalmologists when s/he

'…. recently had someone who had glaucoma and what really swung it was just reading this research about [how] the floppy eyelid syndrome and sleep apnoea were risk factors for glaucoma' (AU focus group).

However, participants' examples here (like the former) need to be treated with caution given that it is not certain whether they applied rigorous EBP search tactics and found and critically appraised all relevant research.

Saudi Arabian participants also gave examples of specific changes they had made in their practice. One such participant used EBP to change how they managed patients with visual disorders, explaining that *'my knowledge about amblyopia, and how to manage amblyopia, dramatically changed with these types of [research-based] reports' (SA interview).* Other participants stated that they changed the types of products they used based on different research sources, which, of course, may be high or low in quality – it is worth noting that usually the participants did not make this distinction. For example, one participant who had introduced new coloured contact lenses for colour blindness to his/her clinic stated that:

'so I gained from the symposium and from the companies that provide the contact lenses…and from reading new sources…and tried to modify something for the patients' (SA interview).

The fact that they gained information from a symposium, which may have been biased by the presence of manufacturers, suggests that the sources themselves may not have been peer reviewed research. Changes in diagnosis and referral were other specific areas that EBP had impacted upon.

For a number of the examples provided above, there was little evidence of the quality (level) or relevance of the information having been assessed by optometrists or the research being critically appraised before it was applied. As a result, some of the above examples of EBP would be considered poor practice, based on anecdotal or low level evidence.

Sources of information ("evidence")

Participants were asked to describe and discuss possible sources of information or evidence used during EBP. Responses were grouped into: conferences and symposia, journals and books, the internet (search engines and electronic databases), and other sources.

1. Conferences and symposia

Both Australian and Saudi Arabian participants considered conferences an important source of information. However, Saudi Arabian participants felt that there exist only a few conferences that offer quality optometry sections in their country; this meant that, in practice, conferences could rarely be utilised as a source of evidence for Saudi participants. Conversely, many Australian participants considered conferences to be a wonderful opportunity for information-sharing and unbiased research; however, as conferences were often attended yearly, other sources of information were reported as being more regularly utilised.

2. Journals and books

Written material was reported by every participant to be a regularly utilised source of information, although the preferred format and method of access varied between respondents. Saudi Arabian participants were more likely to use textbooks, although both Saudi and Australian participants reported that these were often out-dated. Saudi participants explained that their limited access to other types of resources often necessitated the use of textbooks. Some Saudi Arabian and Australian participants mentioned magazines, but journals were more consistently reported as reliable sources of evidence. They are *'always updated, unlike books'* (SA focus group), and some participants also claimed that they tended to find more new information in journals than at conferences. Printed journals were commonly used among both Australian and Saudi Arabian participants, although most Australian participants preferred to access these electronically. The journals mentioned included regional peer- reviewed publications such as *Australian and New*

Zealand Journal of Ophthalmology (renamed *Clinical and Experimental Ophthalmology* since 2000) *and Clinical and Experimental Optometry;* participants also frequently cited some non-peer-reviewed publications such as *MiVision, Insight, Australian Optometry and Optometry Review* as sources of information.

3. Internet (search engines and electronic databases)

Although both Saudi Arabian and Australian participants reported using Google as a source of information, almost all reported doing so reluctantly or with caution. Most agreed that it was difficult to find reliable sources, and to find information that was useful to practitioners, not just patients. Some now make Google or Google Scholar a first step in their research process, as a way of finding issues that interest them to then research further through more reliable sources. While Google Scholar is a valid search engine, similar to PubMed, some used Google only to learn of other online sources:

'First when I started I searched Google…but I found only shallow information. Things that are provided for patients, not for (the) practitioner. … I tried to sign into some websites that provide the information for optometrists, and that way it was more effective for me. Then I try…as much as I can to read the journals.' (SA focus group).

Other participants reported using Medline and other online medical search engines providing access to abstracts of research articles. Online forums, although not as commonly referred to as reliable sources of information, were used by many Australian participants. One Australian interviewee commented that s/he had used online forums in the past, but found that they discussed too much anecdotal evidence and behavioural optometry. However, some Australian participants felt that online forums were at least somewhat helpful as sources of information. Webinars were mentioned

by one Australian participant, who had recently attended an international webinar. While s/he cited this as a useful source, s/he did not express a view on its reliability.

4. Other sources

One Saudi Arabian participant and one Australian participant referred to their own clinical experience as a source of evidence, explaining that this regularly informed their ability to recognise, diagnose, and treat patients' problems. This response highlights the lack of understanding of the true meaning of EBP by some respondents. Clinical experience is an important part of the definition of EBP but is not a source of evidence or information.[1,22,23] Due to the difficulty in obtaining current, reliable information, some Saudi Arabian participants reported the need to rely on sources they did not necessarily consider reliable. When in need of information, some reported taking questions to colleagues and superiors. Others relied on medical supplies companies for information, despite acknowledging the potential biases of the information obtained. Interestingly, existing optometry-related secondary sources of evidence such as the Cochrane Reviews or one of the Australian government's set of National Health and Medical Health Research Council guidelines were not reported as sources of evidence by any participants.

Significance of EBP

Discussions focusing on the perceived importance of EBP revealed optometrists' self-efficacy and attitudes towards the EBP process. Not surprisingly, answers centred on patient care. The views reported by Saudi Arabian and Australian participants were quite similar. Some Australian participants focused on the philosophy of 'do no harm' while some expanded upon this principle to say that EBP helps assure that they actually impact patients positively. As one Australian interview respondent stated:

'I think it's equally important a) to avoid harm, but b) to also be able to confidently give somebody a treatment that you know is going to do them some good.'

EBP was seen as aiding this philosophy by guiding health care practitioners' decision-making processes towards safer and more relevant procedures, as well as patients that are healthier, better managed, and less inconvenienced or financially burdened. One Australian focus group participant illustrated this point:

'Just because optometrists [have] done something… decade after decade, it doesn't actually mean that it works, and we shouldn't really do things unless we're certain that they're going to work. Otherwise it's putting people to unnecessary expense, or time, or trouble.'

This respondent also demonstrates a simplistic and incorrect understanding of the true meaning of EBP. Another participant built further on this point by stating that utilising EBP is practitioners' responsibility:

'I think it's (being) responsible. If we have the information available to us that shows a particular course of action is the most effective in managing a particular condition, then I think we are beholden to put that into place, particularly if it's good research that says this is the best way to manage a particular condition. I think that we should be looking to incorporate that in our management of our patients.' (AU interview)

Beyond considering patient care alone, some Saudi Arabian participants touched on how EBP makes them more competent professionals. One interview respondent asserted that EBP helps practitioners keep up with the field in general *'we are changing, the last year [was] different than this year, and this year different than the next year, so we are not going…on the same [information]*

that we gained from the college.' Participants from both groups felt that EBP was important to some extent.

Barriers and enablers of EBP

Table 3 displays both the barriers that practitioners report in the use of EBP, and their suggestions for improvement (enablers). While there was some overlap in responses between the two groups, there were more barriers reported among Saudi Arabian than Australian participants.

1. Access to information

While participants in both groups had difficulty accessing the necessary information, Saudi Arabian participants in particular could not access enough current information. As one of them reported:

'I Google this stuff, although I don't have much information available. A lot of times I get stuck. I sometimes go to ophthalmologists… I ask around, but I don't think there is much clear information… out there easy to reach.'

Australian participants, on the other hand, reported difficulty with weeding the necessary information out of the overwhelming amount available to them. For them, the problem was:

'….the sheer amount of information that's out there, and what is the most effective way for the average practitioner to access that information' (AU interview).

One Australian interviewee took this point further to suggest that taking too much time to perfect the EBP process may actually create a barrier to practice itself:

'You could subscribe to an awful lot of journals but you'd spend all your time in practice reading the journals and never have time to practice your profession! So you've got to try and find a balance between how much information you go looking for, and how much information you can then put into practice.'

Australian participants also voiced concern over the apparent disconnect between researchers and practitioners. For example, one focus group respondent noted the need for more interaction between them, while another referred to a general 'breakdown' of information:

'So I think it's not necessarily the researchers not disseminating the information, I think there's…a breakdown, the researchers put it out to the journals and it gets out into the journals, and it's peer reviewed and it's accepted. The outcomes are considered to be valid, but unless an optometrist has access to all of those journals, or to some abstract service which enables them to skim through all the stuff as it comes out, and then go looking for the extra information as need be, then they're not going to necessarily see it. And again, unless you go to the right conference, you may not pick up on this information either, so it's not just the researcher's fault or the fault of the institution that's doing the research, it's also to do with the way that it gets sent out into the profession as a whole.' (AU interview)

In light of this, Australian participants suggested a more efficient use of technology to deliver current information to practitioners. Some specifically suggested that the American Academy of Optometry compile and distribute summaries of current research to practitioners by email. Saudi Arabian

participants suggested dealing with these issues by having the Saudi Association of Optometry create clinical guidelines and provide practitioners with better access to a network of information and communication. As one participant explained:

'we need the Society to update us about the conferences and meetings, to give [us] word, like everybody knows everybody, it's like a network' (SA focus group).

2. Education, workplace, and resources

Saudi Arabian participants reported more barriers related to issues with workplace and educational policies than did the Australian group. Saudi participants felt that hospital policies in Saudi Arabia resulted in overworked optometrists who then have limited access to current research and technology. One Saudi Arabian interview respondent spoke of his/her work at a hospital, commenting that:

'there is not time for reading, there is no time for symposium, no time for sharing, or gaining experience or knowledge… all the time it [is] patients, patients, patients.'

Saudi Arabian participants also reported that their educational institutions did not properly teach them how to undertake research:

'In the college we didn't really get the real idea about researching and finding the new information. We just took the old school and photocopied, and they told us that this is how it goes…They never give us any classes about researching, about finding new things, about communicating with other societies of optometry outside the country.' (SA focus group).

In a similar vein, some Saudi Arabian participants viewed individual effort as an enabler to practicing EBP. As explained by one focus group participant *'we graduate with [the] minimum most basic knowledge about optometry, and from there you start developing with individual efforts'.* This concept of individual effort was mentioned as an enabler by many participants, both in the Australian and Saudi Arabian groups. More specifically, participants claimed that optometrists needed to rely on their own *'individual effort'* to seek out and critically appraise research evidence, and to apply that research to their practice in a responsible manner. Many participants saw the need for a balance between the responsibility of organisations and institutions, such as optometry societies and educational facilities, to create standards and facilitate access to important information, and the responsibility of individual optometrists to inform themselves.

Participants in both groups differed in their opinion of how much effort should be required of optometrists in staying informed on current research. Some claimed that practitioners were not employing enough individual effort:

'no, I don't think it [lack of information] is a barrier and I think that the information's there. I think that people just need to be willing to go and find it' (AU interview).

Conversely, other participants felt that the difficulty of accessing necessary information should be ameliorated by institutions and organisations.

The Saudi Arabian focus group also reported issues with lack of resources and infrastructure. For example, the Saudi Association of Optometry is a new organisation which participants saw as having limited reach. Many participants also spoke of out-dated equipment, unreliable information, and

lack of resources and support in schools and the workplace, expressing frustration with these elements; as one respondent illustrates:

'In the United States or Canada or Australia or Europe, all of these they have better [equipment, resources, support] than us, because they have their [professional] society. ' (SA interview)

Saudi participants typically suggested that corresponding changes in hospital policies and the Saudi Association of Optometry were needed in order to provide access to current research and promote ongoing education. In contrast, only one Australian participant felt that schools could be more critical of non-evidence based information, and most Australian respondents did not voice concern with their educational system. This lack of critique, however, does not necessarily reflect a difference between the two educational systems.

3. Conferences

Saudi participants indicated that attending conferences could help practitioners to access global information:

'To participate and to contribute with local, regional, or international and global…scientific optometric conferences, that will stimulate their [optometrists'] interest, and [they will] go and read more, go and participate with these global studies, and feel that they are part of it. That will really create good optometrists in Saudi Arabia who are evidence-based practitioners.' (SA interview)

However, both groups had concerns with the structure of conferences, suggesting that more opportunities for small group discussions and more clinical optometry-focused presentations would help foster EBP. Some of these suggestions were based on experiences gained in international settings; as one Saudi Arabian focus group participant indicated:

'when I was in the US…in the forums they do…for example a chatting room…basically…all doctors get together in this chatting room…and they have a case presentation…and its very nice.'

This idea was echoed by an Australian focus group participant:

'I think the conferences need to be restructured. There needs to be something like case studies that other optometrists have had and they need to be presented.'

Saudi Arabian participants also reported that there was a need for easier access to conferences. Hospital policies often restrict educational leave, and some women cannot attend conferences without spousal or family permission. This important comment is included in Table 3; however, no solutions were offered to ameliorate the issue. Local interpretations of social norms in Saudi Arabia may hinder women's ability to participate in such activities[24] as they need the permission of male relatives to participate in job related activities.

DISCUSSION

Both Australian and Saudi Arabian optometrists in this sample share a broadly similar understanding of EBP and its importance, and a positive outlook towards its integration into optometric practice. These study results agree with those from previous qualitative assessments of EBP attitudes among both medical students and physicians in which, for example, third year Australian medical students were found to hold positive views towards EBP and felt that EBP courses provided students with

knowledge and skills immediately applicable to a variety of clinical settings .[16] Similarly, Canadian physicians were found to hold a positive attitude towards EBP and felt that there were many advantages to acquiring EBP knowledge and skills.[15]

Despite a generally positive attitude towards what they each individually understood EBP to be, the current study demonstrates a great deal of variation around optometrists' understanding of the definition of EBP itself. Some participants felt that EBP was practice based solely on research evidence; however, the integration of research evidence with clinical expertise and patient preferences is actually central to the principles of EBP. In line with this lack of understanding of EBP, none of the optometrist described the five steps process of EBP (ask, acquire, appraise, apply and audit). Step 4 of the EBP process, 'Apply', involves the integration of the most relevant and valid research with clinical expertise and the patient's individual circumstances, in order to arrive at an evidence-based answer.[22] Imparting an understanding that EBP is based upon the synthesis of research evidence with professional expertise rather than research evidence alone is, therefore, likely to improve optometrists' willingness to integrate EBP into their eye care practices.

Australian medical students may have a better understanding of the definition of EBP as it applies to integration into medical practice. In the qualitative assessment of students' understanding and attitudes towards EBM by Ilic and Forbes,[16] the majority of students provided the classic definition of EBM as integrating evidence with medical decision-making. This might be a reflection of differences in the EBP component of the curriculum of these professions with medicine having a much longer history of adoption of EBP than other health professions.

For optometrists, there also appears to be some disagreement on the nature of 'evidence'[11] and, specifically, how to distinguish between low and high quality evidence. For example, while participants in both countries stated that they frequently accessed journal resources, many of the

journals cited were professional publications without peer-review and are therefore not likely to be sources of high level, high quality evidence. Participants also stated that they used online search engines (e.g., Google) and online forums as sources of evidence, despite being sceptical of their reliability. It was interesting that neither existing eye care specific high level secondary evidence (e.g., NHMRC guidelines for glaucoma, Cochrane Eye and Vision Group systematic reviews) nor the guidelines produced by or professional organisations such as Optometry Australia or the British College of Optometrists were quoted by any participant as sources of information.[25,26] Optometry organisations and optometric education providers wishing to increase uptake of EBP in optometry could take steps to increase practitioners' awareness of the existence of these sources of information.

The perceived barriers to EBP vary between Saudi Arabian and Australian study participants. In Saudi Arabia, barriers were directly related to lack of access to sources of evidence, including conferences, electronic resources and other materials. Participants noted that they needed to use textbooks to answer clinical questions despite feeling that these sources were out-dated, due to the lack of alternative resources. The results of this study echo the results seen in a 2010 study of EBP knowledge and skills among physicians in Abha city in Saudi Arabia.[27] The physicians who participated in this study also expressed a generally positive attitude towards EBP but cited lack of resources, namely internet access and educational materials, as the main barriers to practicing evidence-based medicine.[27]

In addition to lack of access to sources of evidence, Saudi Arabian participants in the present study also cited a lack of workforce support and educational infrastructure for EBP practices. The absence of workforce and education support is attributable in part to the relative youth of the Saudi Association of Optometry, which operates under the Saudi Commission for Health Specialties which in turn is a member of the World Council of Optometry. As a World Council of Optometry member

organisation, the Saudi Commission for Health Specialties monitors quality of postgraduate courses, administers examinations, and provides training programmes to practicing health professionals from various specialties.[28] World Council of Optometry membership promises to contribute significantly to the practice of optometry in Saudi Arabia by promoting the organisation of scientific meetings and workshops, and improving practitioners' awareness of these activities.

In Australia, optometrists appeared to be limited not by lack of access to EBP resources but by a lack of awareness and/or access to databases of pre-appraised evidence. Without access to these databases, participants felt that the burden of screening high versus low quality evidence falls on the shoulders of the optometrist. Given the sheer volume of evidence available, study participants cited lack of time to read the research evidence available as the primary barrier to EBP implementation. Lack of time among Australian practitioners from a wide variety of healthcare specialties has been repeatedly cited as a barrier to EBP integration into daily practice.[29-31] Worryingly, the effort and time required in keeping up-to-date was suggested to lead to optometrists devolving the care of patients they feel unable to manage to other practitioners. These results are similar to those found in the qualitative study of Canadian physicians enrolled in an online continuing education course in EBM, where lack of time was cited as the primary obstacle for physicians' completion of the online course content.[15] Participants felt that the time required completing course modules, and the self-discipline required to dedicate time to course content, hindered their involvement.[15] Taken together, the results of the present study underscore the lack of understanding of EBP, the lack of knowledge of how to access existing resources, and the need for the development, dissemination and ease of access to sources of pre-appraised evidence to support optometrists in providing EBP care to all patients.

In a 2011 qualitative study conducted by Lizardono *et al* ,[32] Australian health practitioners expressed the view that a partnership between researchers and health practitioners is essential to an effective and sustainable journal club. Journal clubs are a tool commonly used to promote EBP. Australian participants in the current study also pointed to a perceived divide between academic and non-academic optometrists as an additional barrier to EBP. Practitioners in the present study suggested there was little interaction between academics and practitioner optometrists in Australia, and that this may be contributing to a breakdown in the flow of information from research to practice. Solutions proposed by participants included journal clubs to help share research findings and improve general research, critical thinking, and professional skills, again echoing Lizarondo *et al.*[32] Optometrists generally demonstrated a rudimentary understanding of the definition and process of EBP and of the quality (level) and relevance of research evidence. The value of the barriers and enabler of EBP suggested by respondents must therefore be viewed with that important caveat in mind.

Strengths of this study included the use of qualitative research methods and unbiased trained facilitators. The qualitative methodologies utilised here provide a self-reported indication of self-efficacy in implementing EBP that will arguably assist further investigations into optimum methods to increase translation of research in optometry. Self-efficacy questions addressing all five steps of the EBP process could provide more targeted information.

In addition to providing an indication of self-efficacy among optometrists, the present results provide a mark of optometrists' attitudes towards EBP. The identification of these attitudes could inform development of interventions to enhance EBP. This emphasis on attitudes is important because it is a potential limitation to EBP in practitioners with or without EBP skills and knowledge.

One important limitation of this study is the potential sample bias. The first 16 volunteers who replied had been invited to participate in this study and as a result practitioners who strongly support EBP may have been over-represented. While saturation was achieved with this sample size of volunteers, a possible over-representation of like-minded EBP supporters may have provided an incorrect indication of saturation. Thus, the perspectives collected in the present study may be biased toward positive EBP attitudes, and it is possible that attitudes in the wider optometry community are less positive.

Taken together, the results of the present study underscore the lack of understanding of EBP, the lack of knowledge of how to access existing resources, and the need for the development, dissemination and ease of access to sources of pre-appraised evidence to support optometrists in providing EBP care to all patients.

CONCLUSION

This paper presents results from a study aiming to gain a deep understanding of the perceptions, significance, practices, barriers and enablers of EBP within the optometry field in Australia and in Saudi Arabia. The key finding of this study was that most participants were supportive of EBP, however, their perceptions did not generally reflect a deep understanding of the definition of process of EBP. This level of support may or may not exist in the broader community of optometrists. Participants reported using a combination of low and high level evidence to inform their clinical decisions but there was poor awareness of existing high level secondary sources of evidence in the field of optometry. In line with findings from other health professions, barriers included lack of time and lack of access to information whilst enablers included education, organisational support and self-motivation.

Ultimately, the findings reported here highlight problems with the implementation of EBP in optometry, and suggest a need for more optometry-specific secondary evidence sources such as systematic reviews, critical appraisal topics and perhaps an EBP database of pre-appraised high-quality optometric evidence.

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