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Audience Response System (ARS) Technology and Dentist Attendance in Smoking Cessation Workshop

(Teknologi Sistem Respons Peserta (ARS) dan Kadar Kehadiran Doktor Pergigian dalam Bengkel Berhenti Merokok)

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ABSTRACT

This study assess the effective use of audience response system (ARS), an interactive presenter-audience electronic system, in measuring Malaysian dentists' interest in attending a less explored non-clinical continuing professional education topic. A total of 157 dentists voluntarily attended a specially designed one-day-four-module workshop conducted in four urban locations. The effective use of ARS in commanding attendance was measured in terms of dentists' full seminar attendance to completion and opinion regarding the use of the instrument. The retention rate of workshop attendance to completion in the four locations ranged between 76.5 and 100%. Out of these participants, 93.7% said they enjoyed the ARS approach, 92.4% agreed it motivated them to stay on until the end, 97% said it increased their curiosity and appreciates answering in anonymity. The use of ARS technology is effective in enhancing participants' interest and retention in the workshop, provides interactive learning opportunities and quick feedback and has a potential as an objective instrument in research data collection.

Keywords: ARS effectiveness; dentists; Malaysia; smoking cessation workshop

ABSTRAK

Kajian ini menilai keberkesanan penggunaan teknologi sistem respons peserta (ARS) sebagai alat penyampai pendidikan berterusan dalam topik bukan klinikal yang kurang diceburi doktor pergigian Malaysia. Seramai 157 peserta telah menghadiri bengkel khas sehari yang mempunyai empat modul di empat bandar besar. Keberkesanan penggunaan teknologi ARS ini diukur berdasarkan keterlibatan penuh peserta sehingga kesemua modul selesai serta pandangan peserta diperolehi daripada soalan-soalan bersabit penggunaan teknologi tersebut yang diajukan melalui pembentangan power-point di akhir bengkel tersebut. Kadar keterlibatan penuh peserta bengkel di keempat-empat bandar didapati adalah antara 76.5% dan 100%. Daripada jumlah ini, 93.7% menyatakan mereka menyukai kaedah ARS, 92.4% bersetuju teknologi ini meningkatkan minat mereka untuk mendengarnya sehingga selesai sementara 97% bersetuju penggunaan alat ini meningkatkan rasa ingin tahu dan menghargai kesempatan menjawab soalan secara sulit tanpa pengenalan diri. Hasil ini menunjukkan bahawa penggunaan teknologi ARS berpotensi positif sebagai alat penyampai dan berkesan dalam meningkatkan minat dan kadar keterlibatan peserta di samping memperoleh jawapan yang cepat serta memberi kesempatan untuk peserta belajar secara interaktif sambil memperoleh jawapan yang cepat. Ia juga berpotensi sebagai alat pengukur yang objektif dalam bidang penyelidikan.

Kata kunci: Bengkel berhenti merokok; doktor gigi; keberkesanan teknologi ARS; Malaysia

INTRODUCTION

The computer-based assessments have gained popularity as an interactive teaching method (Holmes et al. 2006; Judson & Sawad 2002) in recent years. Electronic questionnaire versions in particular, hold the potential to be useful measurement tools in both research and intervention programs in various health fields, including dental research (Collins 2002; Judson & Sawad 2002; LaBrie et al. 2006). However, administering electronic questionnaire to groups can be difficult without a multitude of computers. The good part about gathering data electronically from a group is that it paves the route for easy assessment and quick feedback (LaBrie et al. 2006). Some advantages of computer-based assessments include easy-storage and

retrieval of information, the provision of standardized instructions to all respondents and a non-judgmental and non-threatening format for self-reporting. Additionally, respondents of other assessment methods found that computer-based assessments are quicker and easier to complete, enable higher satisfaction in performing the assessment and boost the credibility of later interventions (Cain & Robinson 2008; Elashvili et al. 2008; Johnson 2005; La Brie et al. 2006).

The audience response system (ARS) is a type of computer-based assessment tool interaction that focuses on establishing communication between a presenter and an audience (Collins 2002; Holmes et al. 2006). It is popularly used in game shows to get immediate response in

group settings. Unlike typical computer-based assessment, participants do not have a private screen for questions, instead, questions are projected using presentation-type software like Power Point. The participant response is collected via wireless handheld keypad devices. These devices provide the needed privacy for an individual to answer the questions; hence there is no communication of answers among participants (Collins 2002; La Brie et al. 2006)

Smoking accounts for 5 million deaths a year globally and is expected to rise to 8 million in 2030 (WHO 2009). In Malaysia, it is estimated that 10,000 deaths yearly is due to smoking related illnesses (Krisnan 2003). Prevalence of current smokers in Malaysia is estimated to be 24.4% and slightly more than half (51.1%) are males. Efforts have been primarily initiated by the Ministry of Health Malaysia to curtail the problem. This includes among others; opening of counselling clinics nationwide, introduction of non-smoking areas, increase in cigarette taxes and pictorial warnings on cigarette boxes.

Until recent years, smoking cessation program initiated by the Malaysian Ministry of Health are population-based behavioural intervention programs conducted by medical doctors, trained nurses and pharmacists. Only one dental school (total 12 schools) is known to have formal module on smoking and smoking cessation program (SCP) in their curriculum which started about five years ago. Nevertheless, SCP has been recently included in the National Oral Health Plan for 2011-2020 as part of oral health prevention (Oral Health Division 2011). Unfortunately, the approach has been similar to behavioural approach and not a customized treatment program that dentists are familiar with. In addition, conducting SCP requires dentists to be exposed to or undergo some form of training. There is thus a drive to introduce dentists to SCP in their work places through workshops. However, there is also uncertainty as to how interested dentists are in SCP workshops or in the conduct of the program. Recognizing the above problems, a study on empowering dentists to conduct SCP in their clinics was undertaken. This study reports on the effectiveness of the ARS technology in garnering dentists' interest who attended a specially designed SCP workshop for dentists.

MATERIALS AND METHOD

This is a cross-sectional study evaluating the use of ARS as an interactive mode of collecting information on Malaysian dentists' interest and participation in attending a less explored non-clinical continuing dental education topic. Ethical approval was obtained from the University Malaya Medical Centre Research Ethical Committee prior to the conduct of this study. Implied consent was acquired from all participants who voluntarily agreed to attend the workshop and answer the questions.

The workshops were jointly organized by University of Malaya Centre for Addiction Sciences (UMCAS) and collaborating partners, namely; the Malaysian Dental Association, Faculty of Dentistry, Universiti Kebangsaan

Malaysia and two state government health agencies. Attendance in the first two workshops was voluntary and open for all dentists, both private and government, with a minimal registration fee. The latter was collected more as a show of commitment as this is the first time such a program was conducted. The administrative organization and logistic funding of the two workshops for government dentists were done by the two state level health agencies. However, the whole workshop program and conduct followed closely to the earlier workshops and was totally conducted by the same UMCAS team members comprising of dental specialists and psychiatrists. The latter was not involved in the selection of participants. A simple questionnaire prior to the study indicated that all participants had never attended any formal Smoking Cessation Workshop previously. Participating groups of 50 participants were on a first come first serve basis. The group was kept small to coincide with the number of wireless handheld keypad devices available. In addition, the workshop was only ran once at any one venue and all answers were simultaneously answered. There was no sharing of the device among participants. The technology had been previously tested and used in several studies and found to be effective as a learning tool (Doucet et al. 2009; Latessa & Mouw 2005; Miller et al. 2003). Miller et al. (2003) rated the use of the ARS system highly at 4.58 on a 5-point scale.

A one-day-four-module workshop entitled 'Empowering Dentists into the Smoking Cessation Program' conducted was prepared on Power Point slides by the researchers. The four modules covered the following areas; smoking as a public health problem, smoking as an addiction, roles of dentists in the programme and options of treatment. All questions were in English and had been vetted and validated by the researchers. Each module had a set of 4-5 questions seeking participant's opinion related to the module. Each participant was also randomly allocated with a wireless handheld keypad device of the ARS system by an Information Technology assistant familiar with the operation of the ARS system and not involved in the workshop content or with the trainers. The data were collected prior to the conduct of each of the four modules described above and presented at the end of the presentation. Each power-point module was presented for 30 min. A final set of five questions related to the use of ARS in the workshop was collected before the workshop completion. The effectiveness of the ARS was measured based on retention of participants who completed the four modules and responses from the fifth module.

The ARS computer-based equipment also had the advantages of a built in computer software thus was able to analyse the group responses immediately. All responses automatically 'captured' by the ARS computer were internally analysed, tabulated and presented in the form of graphs or tables. This advantage enabled the responses to be projected on the screen rapidly at the completion of each module session. This was repeated for all sessions. Subsequently, all information collected was retrieved in

the excel spreadsheet format. The data obtained were then transferred to a statistical software package like the Statistical software package for Social Sciences (SPSS) for further analysis.

RESULTS

A total of 157 dentists participated in the four workshops. Female dentists made up almost three quarter (72%) of the total numbers of participants. The age range of all participants was 25 to 62 years with the mean age of 34.4 (s.d \pm 9.36) years old. Slightly less than two third of the dentists (58.6%) reported having been practising the profession for more than three years or more (Table 1).

TABLE 1. Demographic profile of workshop participants ($n=157$)

Profile variables	Mean (SD)	<i>n</i> (%)
Gender		
Male		44 (28.0)
Female		113 (72.0)
Age		
Mean	34.4 (9.36)	
Work duration		
< 3 years		65 (41.4)
3 years & more		92 (58.6)

Our findings also showed the retention rate of workshop participation to completion in the four locations was high, between 76.5% and 100% (Table 2). The retention rate was however, slightly lower among participants in the first two groups which comprised of a mix group of government and non-government dentists. A 100% workshop attendance to completion was observed in the last two workshops conducted for government dentists. Pearson's Chi square test of association showed the difference was however not statistically significant at $p>0.05$.

Of the overall 144 or 97.2% participants who attended the workshop until completion, a majority stated they enjoyed the ARS approach used (93.7%), the approach motivated them to stay on until the end (92.4%) and increased their curiosity (97.2%). All of them (100%) agreed they feel comfortable having to answer questions

in anonymity and when their group responses were shared with them at the end of the module session.

DISCUSSION

The use of ARS indicated an encouragingly high percentage of attendance and complete participation. In addition, the device has been able to enhance curiosity among the participants. This is important as the workshop topic was less popular among Malaysian dentists. This observation may in part be because such an approach has never been used in similar workshops or other learning environment among Malaysian dentists. This finding was nevertheless encouraging and in keeping with other studies which showed positive audience attitude (Johnson 2005; Judson & Sawad 2002; Robin & Le Sage 2009).

Interpretation of complete workshop attendance of the last two groups must also be done with caution. This is because the workshops were organized by the government agencies for their dentists, thus the full attendance can be expected. Nevertheless, the effectiveness on the use of ARS approach can still be argued given that despite having to voluntarily pay a minimum fee, more than three quarters of the mixed private-government dentists groups stayed on until workshop completion.

Another advantage of ARS that has been reported is anonymity and perception, where participants can respond to the ARS questions without being judged by their peers, tutors or the instructors (Collins 2002; Elashvili et al. 2008; Holmes et al. 2006; Latessa & Mouw 2005). The questions on ARS for this workshop was formulated to allow anonymity on the answers responded by the participants. In this study all participants responded positively to the question on anonymity in answering. Anonymity allows all participants to be active members of the classroom community and participate in the learning process without recrimination (Collins 2002; Doucet et al. 2009; Johnson 2005; Robin & Le Sage 2009).

ARS technology had also been reported to increase the quantity and quality of class discussions, especially when carried out with 'peer instruction'. The latter is a strategy that occurs when the teacher or presenter presents a question to the audience using ARS, collects the responses and next, rather than providing them with the correct answer immediately, instead displays the

TABLE 2. Retention of participants to completion of workshop ($n=157$)

Workshop location	Start	Completed	Retention rate (%)
Urban location 1	26	22	84.6
Urban location 2	51	39	76.5
Urban location 3	36	36	100
Urban location 4	44	44	100
All 4 Locations	157	144	91.7

Pearson's Chi square test, $p>0.05$)

TABLE 3. Effective use of ARS in the conduct of SCP workshop (n=144)

Questionnaire items	Agree n (%)	Does not agree n (%)	Uncertain n (%)
I enjoyed the workshop approach	135 (93.7)	5 (3.5)	4 (2.8)
The approach motivated me to stay on to the end	133 (92.4)	5 (3.5)	6 (4.1)
I feel more comfortable answering questions in anonymity	144 (100)	0	0
I like the part when our responses are immediately shared with us	144 (100)	0	0
I find the use of this approach increases my curiosity	140 (97.2)	0	4 (2.8)

responses from the class and instructs them to discuss possible solutions in pairs before voting for the second time (Robin & Le Sage 2009). This 'peer instruction' strategy was used during the dentists' workshop where questions were presented pertaining to the topic discussed prior to the lecture presentation. This was done to get an overview of their perceptions and current understanding on smoking cessation. Henceforth, responses regarding the expectation and understanding of the audience were gained for a better delivery of the presentation. By using ARS, an immediate response from the participants were able to be generated which in turn results in real time discussion and a more interactive participation. Therefore, attention is retained and quality of the discussion is high.

It was observed that the use of the ARS technology in the dentist workshop improves the feedback process not only by guaranteeing participants' anonymity but also in terms of quicker and more efficient method in collecting and summarizing responses, as well as preventing respondents from copying their peers' answers. In addition, ARS holds other benefits such as being cost-effective, easily administered even to large samples, comparatively error-free data entries and quick data analysis (Doucet et al. 2009).

CONCLUSION

The results from this study indicated that the ARS technology was a promising application in enhancing participants' interest and retention in workshops, provide interactive learning opportunities and quick feedback to problems. The technology has a potential to be used as an objective instrument in research data collection. Further research with refined methodology is however needed.

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