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Laypeoples' preferred sources of health information on the emergency management of tooth avulsion

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Abstract – *Aim*: When planning nationwide information campaigns on the emergency management of tooth avulsion, the populations' preference to different modes of information delivery should be taken into consideration. We currently lack information on that. The aim of this study was, therefore, to assess laypeoples' preferred sources of information on the emergency management of tooth avulsion. *Methodology*: This was a joint study undertaken by experts in media and experts in dental traumatology. Interview-assisted questionnaires were conducted on a sample of 579 adults from Kuwait. Subjects were asked to choose their three preferred sources of information on the emergency management of tooth avulsion. Subjects' responses and sociodemographic data were registered. The data were descriptively analyzed, and a chi-square test was used to assess the relation of the subjects' preferences to their registered demographics. *Results*: The Internet, health care professionals, and TV were the three most preferred sources of information on the emergency management of tooth avulsion across all groups, regardless of the sociodemographic characteristics. Younger adults, singles and subjects with higher education significantly preferred the Internet. Older adults preferred TV. Family was a preferred source in geographic districts populated with extended families, while friends were a preferred source in geographic districts populated by expatriates. *Conclusions*: Younger people and those with higher education can be effectively targeted through the Internet, while it is more effective to target older people through TV. Information, on tooth avulsion management, given by health care professionals is preferred across all population segments.

It is widely agreed that, to ensure the best treatment outcome, avulsed teeth should be replanted as soon as possible (1–10). The prognosis of avulsed teeth is, therefore, mostly determined at accident sites. Dental professionals, however, are seldom present at such sites, and as a result, the immediate management of avulsed teeth is likely to be provided by laypeople. Thus, laypeoples' knowledge of the emergency management of avulsed teeth is a key factor in determining treatment success (11–26).

Numerous studies have shown that the level of knowledge about the emergency management of avulsed teeth is low among many groups of society (11–27). This includes children (15–17), parents (17–21), and teachers (22–28). A variety of methods have been deployed in an attempt to improve the general populations' knowledge of how to effectively manage avulsed teeth (28–34), such as distributing leaflets (32, 33) and posters (28), and conducting lectures (30–32, 34). Some studies have measured the effects of such educational interventions and showed their effectiveness in improving knowledge levels within homogenous groups such as schoolteachers (28, 30–32), parents (33), and other laypeople (34). These kinds of interventions, however, may not be as effective when used in nationwide campaigns that target the general population at large, as this wider scope means targeting people with a much wider range of educational levels and sociodemographic characteristics. To deliver information about the emergency management of avulsed teeth in the most effective way in nationwide campaigns, the preference of the population subgroups to different modes of information delivery should be taken into consideration. This receptivity to the different modes of information delivery may be influenced by age. Additionally, other sociodemographic factors such as educational level, gender, and marital status may also affect the population preference to various modes. The authors have not found any study that assessed the subjects' preferred source of information on the emergency management of tooth avulsions. Hence, the aim of this study was to assess laypeoples' preferred source of information on the emergency management of tooth avulsion and to examine the relation of this preference to age, as well as other sociodemographic variables.

Subjects and methods

The study was a joint research project carried out by the Faculty of Dentistry and the Department of Media in the Faculty of Arts, both at Kuwait University.

This was an observational study, conducted on an age-based population sample of adults from Kuwait. A statistically suitable sample size of 0.02% of the Kuwaiti population was included in this study. Over 650 adults were initially interviewed at public places in Kuwait. The sample was then adjusted by a slight reduction in some age-groups to represent the age distribution in the Kuwaiti population. The final sample comprised 579 adults, representing 0.02% of the adult population in Kuwait.

Data were collected by means of a structured interview with the help of a guiding questionnaire. The following demographic data were registered for each subject: gender, age, marital status, education level, and geographic district. From a list of a media options, the study subjects were asked to spontaneously identify the three sources of information, without ranking, that they thought would be most effective at reaching them if an information campaign on the emergency management of avulsed teeth was to be launched. The following media types were given as options: TV, radio, press, the Internet, friends, family, specialized books, educational brochures, and health professionals (such as doctors/dentists). Moreover, they were also encouraged to suggest other preferred sources of information that were not on the list.

The data analysis software SPSS, version 17 (SPSS, Chicago, IL, USA), was used to process and analyze the data. Descriptive statistics were generated as part of the data analysis, and a nonparametric statistic (chi-square) was used to compare the relation of the different demographic factors to the subjects' preferences. The level of significance was chosen at $P \leq 0.05$.

Results

At least 95% of the approached subjects agreed to participate in this study. Five hundred and seventy-nine subjects were included in this study, of which 56% were females. The sociodemographic characteristics of the subjects, including their age, marital status, educational level, and geographic district of residence, are shown in Table 1. Almost 60% of the subjects were in the 20–37 age-group. Most of the subjects were married and had children (54%) or singles (30%). In addition, 56% of them had at least a university degree.

Subjects' preferred sources of information on the emergency management of tooth avulsion: As Fig. 1 makes clear, the Internet, health care professionals, and TV were identified by the subjects as the top three preferred sources of information. Specialized books, brochures, and radio were the three alternatives identified as least preferred.

The relationship between the preferred source of information on the emergency management and participant age is presented in Table 2. The Internet was identified as a significantly preferred source of informa-

Table 1. Sociodemographic characteristics of the study participants

Characteristics	*N*	%
Age		
20–28	169	29
29–37	173	30
38–46	141	24
>46	100	17
Marital status		
Single	147	30
Married, without children	48	8
Married, had children	313	54
Divorced	28	5
Widowed	16	3
Educational level		
<High school	53	9
High school	80	14
Diploma	119	21
University	274	47
Higher education	53	9
Geographic district		
Capital	196	34
Hawaly	138	24
Farwaniya	97	17
Ahmadi	41	7
Jahra	33	6
Mubarak Al-Kabeer	74	13

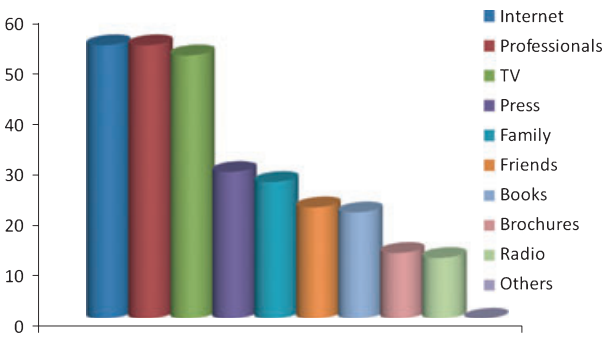

Fig. 1. Subjects' preferred source of information on the emergency management of tooth avulsion.

Table 2. Preferred source of information on the emergency management of tooth avulsion for the different age-groups

	Age			
Media	20–28 (%)	28–37 (%)	38–46 (%)	>46 (%)
Internet	84[1]	59	32	26
Professionals (Doctors/dentists)	50	49	55	64
TV	45	54	48	65[1]
Press	22[1]	31	32	37
Family	28	26	33	21
Friends	24	25	21	18
Books	19	20	20	27
Brochures	13	13	14	9
Radio	9	13	13	17
Others	0	0	0	1

[1]Indicate a statistically significant difference ($P < 0.05$) between the age-groups.

tion by younger adults (20–28 years of age), whereas older adults (>46 years of age) had a significant preference to TV as an information source. Young adults (20–28 years of age) regard printed media as a significantly less preferred source. Health professionals, however, were identified as the preferred source of information across all age-groups. Family, friends, specialized books, and brochures were regarded as less-popular options throughout the dataset, with no significant difference between the different age-groups. Radio was the least preferred source of information for all age-groups.

There was no significant relationship between subjects' preferred source of information and their gender.

However, the different educational levels of the subjects did have a statistically significant bearing on their preferred source of information on the emergency management, Table 3. Subjects who had not completed a full high school education did not prefer the Internet, or the press, as a source of information on the emergency management, as much as those with a higher level of education. The difference between both groups was statistically significant. Specialized books were also found to be significantly more preferred by those who had a higher level of education (diploma and above).

Moreover, marital status was found to relate significantly to the individuals' preferred source of information on the emergency management. Divorced subjects preferred TV as an information source far less ($P < 0.001$) than those who were married. The Internet was identified as a significantly preferred choice for single subjects ($P < 0.001$).

The residential district was found to significantly relate to the subjects' preferred source of information on the emergency management. The Internet, for instance, was preferred less by subjects from Jahra ($P = 0.021$). Specialized books were also preferred less in Jahra and Farwaniya ($P = 0.003$). Information sourced from health professionals was preferred among subjects across all geographic areas, but the level of preference was significantly higher in Hawaly district ($P = 0.001$). In Jahra, family was also identified clearly as a preferred source of information, while subjects from Mubarak Al-Kabeer were found to prefer family the least ($P = 0.019$). In Farwaniya, friends were more often identified as a preferred information source ($P = 0.001$).

Discussion

This study was set out to identify the preferred sources of information regarding the emergency management of tooth avulsions among the adult public in Kuwait. The results found that both age and other sociodemographic factors such as education, marital status, and the geographic area of residence affected the preferred source of information. These results clearly indicate that these characteristics should be taken into consideration when designing an information campaign on the emergency management of tooth avulsion.

This project was carried out jointly by media experts and experts in dental trauma. The study was the first of its kind to deploy this approach within the field of dental traumatology. One study, conducted by Mendelsohn (35), stressed the importance of close collaboration between communication specialists, social scientists, and experts in the field, for campaigns to result in effective and prompt attitude changes. Our results also suggest that this approach is crucial when planning effective national campaigns. Media experts have the best background knowledge when it comes to identifying the most effective ways to transmit information to society in a targeted way. They are uniquely able to deliver carefully composed messages to certain target groups by selecting the right mix of media channels.

Earlier studies focused mostly on particular sections of the society such as schoolteachers, parents, or children (12–28, 31–34) (http://www.iadt-dentaltrauma.org/web/). Our aim, however, was to look at a cross section of the society as a whole. A population-based sample was chosen to enable comparison between the different age-groups in the society. This also enabled us to detect some differences related to other sociodemographic variables. However, in this study, standardization was only carried out with regard to age, a fact that should be taken into consideration when interpreting results.

A high proportion of our subjects (47%) were found to be university educated. Although Kuwait does have a relatively high proportion of university-educated adults

Table 3. Preferred source of information on the emergency management of tooth avulsion for the different education-level subgroups

	Education				
Source of information	<High school (%)	High school (%)	Diploma (%)	University degree (%)	Higher education (%)
Internet	25[1]	49	50	64	45
Professionals (Doctors/dentists)	64	45	45	57	55
TV	55	40	51	55	53
Press	13[1]	23	39	30	32
Family	38	33	29	24	23
Friends	30	35	21	19	19
Books	13	9	32[1]	20	25
Brochures	8	6	14	14	15
Radio	11	14	14	11	15
Others	0	0	1	0	0

[1]Indicate a statistically significant difference ($P < 0.05$) between the different education-level groups.

(around 22%) (http://www.paci.gov.kw/Sttc/Sttcindex.aspx), the higher proportion in our dataset is likely to reflect the fact that we did not standardize for education in our sample selection.

We found that the interviews were a very effective way of gathering information, as this structure allowed subjects to ask questions should anything not be understood. The number of people who refused to take part in this study when we approached them was relatively small, less than 5%. This is probably because the subjects were informed that the interviews would only last a relatively short time. This factor improved the subject participation rate; we speculate that, had the interviews been longer, the refusal rate would likely to rise. While short interviews improve the likelihood of a high participation rate, they carry the risk that subjects do not reflect deeply enough on the questions. This should be taken into consideration when drawing conclusions from short interview-based studies.

The knowledge among the lay community about tooth avulsion management and replantation has been the focus of many studies. Hamilton et al. (12), in their study on laypeople from North East England, concluded that over 80% of those interviewed were not comfortable replanting avulsed teeth because of their inadequate knowledge. Studies on the knowledge of schoolteachers from Kuwait (30), Brazil (22, 23), the United Kingdom (24), Southern Europe (25), Singapore (26), and many other parts of the world on the replanting of avulsed teeth showed that most laypeoples' knowledge in this area was inadequate. Several studies have assessed the level of parental knowledge on tooth avulsion. For instance, the study of Al-Jame et al. (18) assessed Kuwaiti parents' knowledge of this area, and another study conducted by Al-Jundi et al. (20) assessed Jordanian mothers' knowledge. Both studies concluded that the parents' knowledge of how to manage avulsed teeth was inadequate, and their findings have been corroborated in similar studies from a variety of countries (13, 17, 19, 21). Sae Lim (17) studied how much children knew about the management of avulsed teeth and found an insufficient knowledge level. In addition, Andersson et al. (15) investigated the knowledge of Kuwaiti schoolchildren regarding this subject area and found that it was low, despite having adequate knowledge in managing other types of body injuries. Similar findings have been reported by Castilho et al. (16) and Levin et al. (34).

Numerous attempts have been made to assess the effectiveness of different educational intervention on laypeoples' knowledge of tooth avulsion. Most of these studies have shown that it is possible to increase their knowledge level with different educational interventions, such as posters and information leaflets, both of which have been effective in improving the knowledge of selected homogenous groups (32, 33). Another study has shown that even the distribution of a simple leaflet would considerably increase the knowledge level about the emergency management of avulsed teeth as compared to a control group (33). However, these kinds of experimental situations may not necessarily reflect how interventions would work in a real-life situation. The subjects in these studies were presented with a brochure and were actively asked to read the material given as part of a study, which may have been a factor in them paying more attention to the brochure content. The results of our study, however, suggest that brochures tend not to be regarded as an attractive source of information by most people in society. Indeed, many leaflets and posters may not be read in a real-life situation, where people are exposed daily to an overwhelming amount of printed material through the mail, at malls, and in many other places. A Dutch study on the efficacy of brochures in health education concluded that, for brochures to be effective, they must have a very well-developed layout (36). Other studies have also shown that the level of information recall from posters and flyers in pharmacies and doctors' offices varies according to gender, with women showing a higher retention of information (37). In our study, however, no significant gender differences were found in terms of the preferred source of information.

Lectures and discussions, either alone or combined with other reading material, have been shown to be somewhat more effective than brochures in educating homogeneous groups of laypeople such as teachers, young adults, and parents. These results may indicate that the increased chance of interactions during these kinds of educational sessions improves the efficacy of information transmission (30–32, 34). However, delivering lectures is not a very cost-effective way to target an entire society, as it requires significant resource investment.

The results of our study suggest that the planning of a national health campaign on the emergency management of tooth avulsion should be based on an awareness of the strengths and limitations of each mode of information delivery and on how they might be perceived by different groups within the society. In the current study, the Internet was regarded as the best way of transmitting the information across all ages, especially among young adults. Society is changing rapidly, and over the past decade, the Internet has become a powerful communication channel. Consumers are increasingly using the Internet to look for health-related information (38). Social media such as Facebook, Twitter, and YouTube are communication tools that are used on an almost daily basis by young adults, and they can therefore be utilized effectively to deliver such information to this age-group. For instance, placing advertising banners and video sequences on Facebook and YouTube will be an effective way to transmit information of this kind. In other fields of health information, various studies have shown that new media such as the Internet are more effective in promoting knowledge retention than are traditional media (39). Many studies warned against laypeoples' inadequate skills in assessing the quality of health information found on the Internet, as well as their ability to understand complex health messages (38, 40). In using the Internet as a source of information to the public on the emergency management of tooth avulsion, it is therefore important to keep the message clear and simple.

Although findings of our study indicate a strong preference to the Internet as a mode of information

delivery, our study did not explore the reasons behind such preference. Our findings need to be, therefore, complimented with further research in this area.

TV and printed media (press) were also perceived by the subjects as powerful information modes in our study, especially among older adults. In a survey of 452 American adolescents, it was shown that TV, radio, and the Internet were the most important health information sources for American teens (41). Our findings confirmed that TV was a popular source of information; however, it was preferred to a greater extent among older adults in our dataset. In addition, our findings indicated that radio was not an effective source of information on the emergency management. Such differences may reflect cultural differences in media-related practices between the United States and Kuwait. Another study has shown that well-designed mass media campaigns can be an effective way to improve the knowledge level of a society (42).

Our study makes it clear that all age-groups preferred to receive information from health care professionals such as doctors and dentists. This is probably a reflection of the perceived credibility of these sources. Campaigns should, therefore, be designed to have such synergistic effects, for example, having a health care professional convey the message through the Internet, TV, or printed media. Today, the concepts and theories of integrated communication are slowly being introduced to educational campaigns in society, as it has become clearer that the communication of one message through various media in accordance with the relevant target audience media consumption patterns can be a very helpful approach. This approach is worth considering not only for information regarding tooth avulsion and replantation but also for any oral health information campaign.

Family and social networks are valuable sources for spreading health information in the community. The findings of our study indicate that, in geographic areas that were predominantly populated with locals and extended families, such as Jahra, family was a preferred source of information. The influence of family, however, was not as high in geographic districts where the majority of inhabitants were expatriates, such as in Farwaniya. Friends were a more preferred source of information on the emergency management in such districts. This is probably due to the limited family network present locally for an expatriate. One should, however, be careful when drawing such conclusions based on the findings of the current study alone.

The correct management by laypeople of avulsion injuries requires widespread education to the public. Despite the low level of knowledge, many laypeople have expressed a strong interest in helping victims with traumatic dental injuries (11). Clearly, the problem lies in getting the message out to society in the most effective way. It is hoped that the present article had shed some light on this issue, particularly in terms of the efficacy of using several media modes at once, each of which can reach certain target groups and thus ensure widespread exposure. Combining selected modes can produce a synergistic effect in delivering effective messages. Finding the right media mix to ensure exposure of a message to certain target groups could be a challenge for health care professionals working independently. Cooperating with mass media experts is therefore recommended, as it can facilitate choosing the most appropriate media mix, to ensure the effectiveness of the conveyed message.

References

1. Flores MT, Andersson L, Andreasen JO, Bakland LK, Malmgren B, Barnett F et al. Guidelines for the management of traumatic dental injuries. II. Avulsion of permanent teeth. Dent Traumatol 2007;23:130–6.
2. Andersson L, Amir F, Al-Asfour A. Oraltraumaguide for dentists in Kuwait. Kuwait: Kuwait University Press; 2003.
3. McIntyre JD, Lee JY, Trope M, Vann WF Jr. Permanent tooth replantation following avulsion: using a decision tree to achieve the best outcome. Pediatr Dent 2009;31:137–44.
4. McIntyre JD, Lee JY, Trope M, Vann WF Jr. Management of avulsed permanent incisors: a comprehensive update. Pediatr Dent 2007;29:56–63.
5. Andreasen JO, Andreasen FM, Bakland LK, Flores MT. Traumatic dental injuries. A manual, 2nd edn. Oxford: Blackwell Munksgaard; 2003. p. 66.
6. Andreasen JO, Andreasen FM, Andersson L. Textbook and color atlas of traumatic injuries to the teeth, 4th edn. Oxford: Blackwell Munksgaard; 2007. p. 444–88
7. Andreasen JO, Andreasen FM, Skeie A, Hjorting-Hansen E, Schwartz O. Effect of treatment delay upon pulp and periodontal healing of traumatic injuries: a review article. Dent Traumatol 2002;18:116–28.
8. Chappuis V, von Arx T. Replantation of 45 avulsed permanent teeth: a 1-year follow up study. Dent Traumatol 2005;21:289–96.
9. Andreasen JO, Bakland LK, Andreasen FM. Traumatic intrusion of permanent teeth. Part 3. A clinical study of the effect of treatment variables such as treatment delay, method of repositioning, type of splint, length of splinting and antibiotics on 140 teeth. Dent Traumatol 2006;22:99–111.
10. Schwartz O, Andreasen FM, Andreasen JO. Effects of temperature, storage time and media on periodontal and pulpal healing after replantation of incisors in monkeys. Dent Traumatol 2002;18:190–5.
11. Glendor U. Has the education of professional caregivers and lay people in dental trauma care failed? Dent Traumatol 2009;25:12–8.
12. Hamilton FA, Hill FJ, Mackie IC. Investigation of lay knowledge of the management of avulsed permanent incisors. Endod Dent Traumatol 1997;13:19–23.
13. Stokes AN, Anderson HK, Cowan TM. Lay and professional knowledge of methods for emergency management of avulsed teeth. Endod Dent Traumatol 1992;8:160–2.
14. Qazi SR, Nasir KS. First-aid knowledge about tooth avulsion among dentists, doctors and lay people. Dent Traumatol 2009;25:295–9.
15. Andersson L, Al-Asfour A, Al-Jame Q. Knowledge of first-aid measures of avulsion and replantation of teeth: an interview of 221 Kuwaiti schoolchildren. Dent Traumatol 2006;22:57–65.
16. Castilho LR, Sundefeld ML, de Andrade DF, Panzarini SR, Poi WR. Evaluation of sixth grade primary schoolchildren's knowledge about avulsion and dental reimplantation. Dent Traumatol 2009;25:429–32.
17. Sae-Lim V, Chulaluk K, Lim LP. Patient and parental awareness of the importance of immediate management of traumatised teeth. Endod Dent Traumatol 1999;15:37–41.
18. Al-Jame Q, Andersson L, Al-Asfour A. Kuwaiti parents' knowledge of first-aid measures of avulsion and replantation of teeth. Med Princ Pract 2007;16:274–9.

19. Santos ME, Habecost AP, Gomes FV, Weber JB, de Oliveira MG. Parent and caretaker knowledge about avulsion of permanent teeth. Dent Traumatol 2009;25:203–8.
20. Al-Jundi SH. Knowledge of Jordanian mothers with regards to emergency management of dental trauma. Dent Traumatol 2006;22:291–5.
21. Raphael SL, Gregory PJ. Parental awareness of the emergency management of avulsed teeth in children. Aust Dent J 1990;35:130–3.
22. Pacheco LF, Garcia PF, Letra A, Menezes R, Villoria GEM, Ferreira SM. Evaluation of the knowledge of the treatment of avulsions in elementary school teachers in Rio de Janeiro, Brazil. Dent Traumatol 2003;19:76–8.
23. Mori GG, Turcio KHL, Borro VPB, Mariusso AM. Evaluation of the knowledge of tooth avulsion of school professionals from Adamantina, Sao Paulo, Brazil. Dent Traumatol 2007;23:2–5.
24. Blakytny C, Surbuts A, Thomas A, Hunter L. Avulsed permanent incisors: knowledge and attitudes of primary school teachers with regard to emergency management. Int J Paediatr Dent 2001;11:327–32.
25. Caglar E, Ferreira LP, Kargul B. Dental trauma management knowledge among a group of teachers in two south European cities. Dent Traumatol 2005;21:258–62.
26. Sae-Lim V, Lim LP. Dental trauma management awareness of Singapore pre-school teachers. Dent Traumatol 2001;17:71–6.
27. Feldens EG, Feldens CA, Kramer PF, da Silva KG, Munari CC, Brei VA. Understanding school teacher's knowledge regarding dental trauma: a basis for future interventions. Dent Traumatol 2010;26(2):158–63.
28. Lieger O, Graf C, El-Maaytah M, Von Arx T. Impact of educational posters on the lay knowledge of school teachers regarding emergency management of dental injuries. Dent Traumatol 2009;25:406–12.
29. Andreasen JO, Andreasen FM, Andersson L, editors. Textbook and color atlas of traumatic injuries to the teeth, 4th edn. Chapter 35. Ames, IA: Blackwell Munksgaard; 2007. p. 869–75.
30. Al-Asfour A, Andersson L, Al-Jame Q. School teachers' knowledge of tooth avulsion and dental first aid before and after receiving information about avulsed teeth and replantation. Dent Traumatol 2008;24:43–9.
31. McIntyre JD, Lee JY, Trope M, Vann WF Jr. Effectiveness of dental trauma education for elementary school staff. Dent Traumatol 2008;24:146–50.
32. Frujeri Mde L, Costa ED Jr. Effect of a single dental health education on the management of permanent avulsed teeth by different groups of professionals. Dent Traumatol 2009;25:262–71.
33. Al-Asfour A, Andersson L. The effect of a leaflet given to parents for first aid measures after tooth avulsion. Dent Traumatol 2008;24:515–21.
34. Levin L, Jeffet U, Zadik Y. The effect of short dental trauma lecture on knowledge of high-risk population: an intervention study of 336 young adults. Dent Traumatol 2010;26:86–9.
35. Mendelsohn H. Some reasons why information campaigns can succeed. Public Opin Quart 1973;37:50–61.
36. Kools M, Ruiter RAC, Van de Wiel MWJ, Kok G. Testing the usability of access structures in a health education brochure. Br J Health Psychol 2007;12:525–41.
37. Manero E. Patient and public involvement in planning and delivering psychological therapies. Healthc Counsell Psychother J 2008;8:13.
38. Eysenbach G, Köhler C. How do consumers search for and appraise health information on the world wide web? Qualitative study using focus groups, usability tests, and in-depth interviews BMJ 2002;324:573–7.
39. Prathap D P, Ponnusamy KA. A comparison of mass media channels in terms of knowledge retention. Int J Instr Media 2009;36:73–9.
40. Peterson G, Aslani P, Williams K. How do consumers search for and appraise information on medicine on the internet? A qualitative study using focus groups J Med Internet Res 2003;19:5.
41. Lariscy R W, Reber B H, Paek H. Examination of media channels and types as health information sources for adolescents: comparisons for black/white, male/female, urban/rural. J Broadcasting Electronic Media 2010;54:102–20.
42. Noar SM. A 10-year retrospective of research in health mass media campaigns: where do we go from here? J Health Commun 2006;11:21–42.