

Fear and Anxiety Pathways Associated with Root Canal Treatments Amongst a Population of East Asian Origin

 Wei Ju CHEN,  Ava CARTER,  Mark BOSCHEN,  Robert M LOVE,  Roy GEORGE

ABSTRACT

Objective: This study aimed to identify and compare the pathways of endodontic fear and anxiety amongst East Asian origin patients attending Griffith University's Dental Clinics, Gold Coast, Australia.

Methods: East Asian patients who attended the Griffith University dental clinics were included in this study. The "My Endodontic Fear" survey was used. The pathways involved in self-perception of dental fear and anxiety were assessed through 5 different questions. Chi-square test was for statistical analysis and the level of significance was set at $P < 0.05$.

Results: One hundred and forty six participants ($n=146$) (ages 18-62 years) of East Asian descent met the criteria to participate. 58.2% were females, and 41.8% males. The ethnicities were split into Chinese origin and non-Chinese origin (Korean, Phillipino, Japanese, Vietnamese). Results indicate multiple pathways affect the origin of fear, regardless of ethnicity. The Cognitive Conditioning pathway was the primary pathway selected by the Chinese and non-Chinese sub groups (51.4%, 43.6%) followed by the Informative (38.3%, 38.5%), then Vicarious (27.1%, 33.3%) and Parental (18.7%, 33.3%) pathways respectively. The Verbal Threat pathway was the least selected pathway for both groups, however the non-Chinese group selected this pathway significantly more often than the Chinese group ($P < 0.001$).

Conclusion: This study demonstrates that the Cognitive Conditioning pathway was the primary fear and anxiety pathway utilized by both East Asian sub-groups. Understanding how patients develop fear and anxiety can help treating dentists discuss triggering factors for patients and alleviate undue anxiety prior to treatment.

Keywords: Asians, dental fear, dental anxiety, endodontics, fear pathways

HIGHLIGHTS

- Variation in perception of fear and anxiety exists within the East-Asian ethnic groups; highlighting the cultural variations within the group.
- Multiple pathways are responsible for the perceived origin of fear and anxiety.
- Dentist should be aware of the possible influence of cultural factors when managing patients with endodontic fear and anxiety.

INTRODUCTION

Dental fear and anxiety is often reported as one of the major patient led factors associated with avoidance of the dentist (1). Avoidance and delaying appointment has been shown to result in poor oral health, which then perpetuates more anxiety and continues the circle of anxiety and fear (2, 3). The aetiology of dental fear and anxiety appears to be a combination of genetic, behavioural and cognitive

factors (4-6). Whether cultural factors play a significant role is not yet well understood, however, previous studies reported that the prevalence of dental fear varies amongst different cultures (7). In addition, the development of these fears (also known as pathways) can be dependent on many factors, such as the individual's ethnicity, gender, and socio-economic status (8-10). Carter et al. (9) reported five pathways of fear in dentistry: Conditioning (fear acquired through personal traumatic experience), Informative (fear acquired from negative experiences of others), Vicarious (fear acquired through observing pain in others), Verbal Threat (fear acquired through threatening negative experiences) and Parental (fear acquired from exposure to parental dental fear) (9, 11, 12).

To date there are only a few studies on dental fear and anxiety which focus on East Asian populations. In a cross cultural study, Nigerian children were found to have significantly greater ($P < 0.0001$) level of fear when compared to American, Australian and Chinese children (8). These

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From the School of Dentistry and Oral Health (W.J.C., A.C. M.B., R.L., R.G. ✉ drroygeorge@gmail.com) Griffith University, Gold Coast, Australia

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differences may be explained by cultural differences and exposure to different fear triggering objects or events such as personal experience, media influences and family background (8). Additionally, previous access to dental care could also act as a modifying factor (13). It appears that previous positive experiences may help decrease dental fear and anxiety in both children and adults (14).

Studies of dental fear and anxiety in adults show a higher percentage of dental fear in the East Asian population compared to other ethnicities. For example, a cross cultural study of Danish adult patients showed that only 15% reported dental fear when compared to 30% of Chinese adult patients (7). A Japanese study showed that 42.1% of the Japanese adult participants reported experiencing fear at some point during, before or after their dental appointments (13). Although there exists some data on whether the East Asian population experiences dental fear, it is not known which pathway is utilized most, or whether there are differences in perception between the different ethnic sub-groups in this population (9, 15).

Given that Australia is a multicultural nation, with 28.5% of its population born overseas and with 2.7% of its population reporting in the census as having an Asian background, it is important for Australian dentists to understand how different groups perceive dental treatment (16). As each East Asian country has their own distinct culture, with differences in lifestyle, child rearing, religion and diet, the manner in which oral health is supported and nurtured may affect development of adult dental fear. Whether the action taken and attitude to managing poor oral health differs amongst Western and Eastern cultures is not discussed in this paper, but does appear to impact the development of dental fear and anxiety (17, 18).

It is beneficial for oral health practitioners in multicultural societies to understand that cultural differences may influence an individual's dental fear and anxiety and hence their attitude towards oral health (19). Understanding the perceived origins of fear and anxiety may also help the practitioner individualize patient care and management.

This study aimed to identify and compare the origin and pathways of endodontic fear and anxiety amongst East Asian origin patients attending Griffith University's Dental Clinics, Gold Coast, Australia.

MATERIALS AND METHODS

This study was approved by the Human Ethics Committee (HREC GU Ref No: 2016/569).

Participants

This study included all East Asian patients who attended the Griffith University dental clinics. The study was open for a period of 6 months (January 2017-July 2017). Inclusion criteria were as follows: participants must be East Asian and have undergone or are currently undergoing root canal therapy, the participant must also remember having the root canal treatment. Exclusion criteria was as follows: participants with mental disabilities, under the age of 18 and participants who had not had a root canal treatment or could not remember their root canal treatment experience.

To ensure an adequate level of participation, the Queensland Health's Southport Health Precinct Oral Health Service, which has a substantial number of East Asian patients, was requested to participate.

Purposive sample technique was used to allow for selection of participants based on their ethnicity. The census showed that approximately 1.3% of Gold Coast's population was of Chinese ethnicity (20) random sampling may not provide sufficient statistical power. It was assumed that the patients attending Griffith University's dental clinical and Queensland Health's Southport Health Precinct Oral Health Service will have a similar population profile as the census.

Data collection

All participants were required to provide informed consent prior to participation in the study. Informed consent was obtained after the participants had completely read the provided information sheet. Participation was voluntary and the participants were informed that they have the right to withdraw at any time. No help or intervention was provided in answering the questionnaire. The questionnaire were distributed by clinic staff or the student operator.

Measures

This study utilized a validated survey tool previously reported by Carter et al. (9); My Endodontic Fear Questionnaire (9, 21).

Questionnaire components and statistical analysis

The pathways involved in self-perception of dental fear and anxiety were assessed through 5 different questions which reflect the psychological impact of the origin of the fear itself.

1. Conditioning pathway- Have you in the past ever experienced a strong discomfort associated with dental treatments (other than for a Root Canal treatment)?
2. Informative pathway- Do you recall anyone with unpleasant experiences following a Root Canal treatment?
3. Parental Pathway- Do your parents have a fear of Root Canal treatments?
4. Verbal Threat Pathway- Have you ever been threatened to be taken to a dentist as a form of punishment for not behaving well?
5. Vicarious Pathway- Do you think negative characterization of the dentist on TV or other forms of visual media can have an effect on your fear of the dentist?

All data were categorized and analyzed using IBM SPSS (V25.0) and GraphPad (Prism 5, The perceived pathways were determined and analyzed for statistical significance using Chi-square test, with every group assessed separately. The significance was set at $P < 0.05$.

RESULTS

One hundred and forty six participants between the ages of 18 and 62 years of East Asian descent met the criteria and consented to participate in the survey. 58.2% were female and 41.8% were male. One hundred and seven of these participants

TABLE 1. Ethnicity of participants

Ethnicity	Frequency	Percent (%)
Chinese	107	73.29%
Korean	21	14.38%
Vietnamese	9	6.16%
Japanese	7	4.79%
Philippino	2	1.37%

were of Chinese origin, while the remaining were categorized as non-Chinese participants (n=39) from either a Korean, Japanese, Vietnamese or Filipino background (Table 1).

Table 2 summarizes fear pathways and ethnicities in the study. Both the Chinese population and the non-Chinese population perceived that the Conditioning Pathway influenced their fear perception the most. The Informative Pathway (38.3% in Chinese and 38.5% in non-Chinese), Vicarious Pathway (27.1% in Chinese and 33.3% in non-Chinese), and the Parental Pathway (18.7% in Chinese and 33.3% in non-Chinese) were the next most used pathways. The Verbal Threat Pathway had the least influence on fear perception in both the Chinese (4.7%) and the non-Chinese (23.1%). The major difference between the two groups was observed in the perception of fear using the Verbal Threat Pathway. However, a significantly greater proportion of non-Chinese respondents compared to their Chinese counterparts were influenced by the Verbal Threat pathway ($P < 0.001$). Confounding factors such as age and gender were not analysed separately because this was beyond the scope of this study.

DISCUSSION

It is estimated that 18% percent of people who avoid the dentist do it because of dental fear and anxiety (22). Effective and personalized management of dental fear and anxiety can reduce dental avoidance and help improve oral health (14). The current study assessed the self-perception of dental fear and anxiety in an East Asian population and sub-groups. The Conditioning pathway (where fear is learnt through an individual's

direct negative personal experiences) had the biggest influence on both the Chinese population (51.4%) and the non-Chinese population (43.6%).

This study did highlight that other pathways were also perceived to have an influence on the overall development of fear and anxiety. This is similar to Carter et al.'s study where participants perceived the influence of more than one pathway in the development of their fear perception (9). The three main pathways which were used by the participants in this study included the Conditioning pathway, Vicarious pathway and the Informative pathway. Even though the primary pathway of fear perception was Cognitive Conditioning, the overall fear perception may be influenced by a combination of different pathways (23). Furthermore, the difference in pathways could be due to acculturation where racial and cultural changes occur as individuals integrate into a new society and community and values and ideologies of health care may change with this (15). The difference in the reported pathway between this study and that reported by Carter et al., could be attributed to the smaller sample size of East Asian participants in the latter study (9). However it is also possible that the confounding factors could have influenced the finding. Assessment of how education and the exposure to dental procedures affects one's fear and anxiety would help determine whether this is an element of dental fear and anxiety that can be managed by the clinician.

When comparing Chinese patients with non-Chinese patients, the biggest difference was seen in the Parental Pathway and the Verbal Threat Pathway. There was a higher percentage of non-Chinese participants responding to both pathways compared to Chinese participants. This suggests that different Asian cultures may have acquired different levels of fear and anxiety derived from their parents. Whether this is due to how they discuss oral health, whether oral health is considered important or is highly respected, or if visiting the dentist is used as a threat to punish children as described in previous literature (14) may explain this difference.

TABLE 2. Self-perceived pathways of fear and anxiety

Fear pathway	Chinese (%) n=107	Other asians (%) n=39	Significance
A1. Conditioning pathway	51.4	43.6	NS
A2. Informative pathway	38.3	38.5	NS
A3. Parental pathway	18.7	33.3	NS
A4. Verbal threat pathway	4.7	23.1	***
A5. Vicarious pathway	27.1	33.3	NS
Significance	A1>A2 (NS) A1>A3*** A1>A5***>A4*** A2>A3* A2>A5*>A4*** A3>A4*** A5>A3(NS) A5>A4***	A1>A2 (NS) A1>A3(NS) A1>A4* A1>A5 (NS) A2>A3 (NS) A2>A4* A2>A5(NS) A3>A4 (NS) A5=A3 A5>A4 (NS)	

NS: Not significant ($P > 0.05$), $P < 0.05^*$, $P < 0.01^{**}$, $P < 0.001^{***}$

The non-Chinese groups were also more influenced by the informative pathway, which suggests that they are more prone to dental fear and anxiety when they learn about bad treatment experiences from their friends and family. A possible explanation for this could be that non-Chinese groups have different cultural practices in upbringing that shape them to be more inclined to trust word of mouth experiences (24). Furthermore, the results from this study suggest that it is more common for non-Chinese groups to use dental treatments as a form of threat (Table 1).

Factors, such as ethnicity, religion, personal experience, media influences and family background could have influenced the perception of fear of the participants. The extent of the influence for these threats in the development of fear and anxiety is not known, and would be difficult to assess in a quantitative study (11). The current study assessed the perception of fear pathways in a single population of East Asian origin dental patients and the sub-groups of ethnicities amongst the sample, further qualitative research may assist in the understanding of these more personal psychological factors that appear to influence patients consistently in the literature (9, 11, 14, 16).

CONCLUSION

This study demonstrates that personal experiences and environment affect fear and anxiety and that ethnicity alone is not a significant explanation for the multifaceted condition that is dental fear. Results indicate that the overall perception of fear is likely multifaceted, but many people draw a significant portion of their fear from direct experiences (Cognitive Conditioning). A collective influence of well engrained cultural systems of traditional Eastern medicine and dentistry may impact the level of anxiety felt by patients within this sub-population. It is important that the treating dentist understands the possible influencing factors of culture and patients' previous negative experiences. Managing fear and anxiety customizing treatment plans to promote a safe and calm environment with longer appointments, and discussing patients concerns prior to treatment is one way of achieving this.

Disclosures

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REFERENCES

1. Armfield JM. The extent and nature of dental fear and phobia in Australia. *Aust Dent J* 2010; 55(4):368–77.
2. Armfield JM, Spencer AJ, Stewart JF. Dental fear in Australia: who's afraid of the dentist? *Aust Dent J* 2006; 51(1):78–85.
3. De Jongh A, van der Burg J, van Overmeir M, Aartman I, van Zuuren FJ. Trauma-related sequelae in individuals with a high level of dental anxiety. Does this interfere with treatment outcome? *Behav Res Ther* 2002; 40(9):1017–29.
4. Gregory AM, Eley TC. Genetic influences on anxiety in children: what we've learned and where we're heading. *Clin Child Fam Psychol Rev* 2007; 10(3):199–212.
5. Mineka S, Ohman A. Phobias and preparedness: the selective, automatic, and encapsulated nature of fear. *Biol Psychiatry* 2002; 52(10):927–37.
6. Carrillo-Diaz M, Crego A, Armfield JM, Romero-Maroto M. Treatment experience, frequency of dental visits, and children's dental fear: a cognitive approach. *Eur J Oral Sci* 2012; 120(1):75–81.
7. Schwarz E, Birn H. Dental anxiety in Danish and Chinese adults—a cross-cultural perspective. *Soc Sci Med* 1995; 41(1):123–30.
8. Ollendick TH, Yang B, King NJ, Dong Q, Akande A. Fears in American, Australian, Chinese, and Nigerian children and adolescents: a cross-cultural study. *J Child Psychol Psychiatry* 1996; 37(2):213–20.
9. Carter AE, Carter G, Boschen M, AlShwaimi E, George R. Ethnicity and Pathways of Fear in Endodontics. *J Endod* 2015; 41(9):1437–40.
10. Milgrom P, Coldwell SE, Getz T, Weinstein P, Ramsay DS. Four dimensions of fear of dental injections. *J Am Dent Assoc* 1997; 128(6):756–66.
11. Carter AE, Carter G, Boschen M, AlShwaimi E, George R. Pathways of fear and anxiety in dentistry: A review. *World J Clin Cases* 2014; 2(11):642–53.
12. Armfield JM. Australian population norms for the Index of Dental Anxiety and Fear (IDAF-4C). *Aust Dent J* 2011; 56(1):16–22.
13. Domoto PK, Weinstein P, Melnick S, Ohmura M, Uchida H, Ohmachi K, et al. Results of a dental fear survey in Japan: implications for dental public health in Asia. *Community Dent Oral Epidemiol* 1988; 16(4):199–201.
14. Armfield JM, Slade GD, Spencer AJ. Dental fear and adult oral health in Australia. *Community Dent Oral Epidemiol* 2009; 37(3):220–30.
15. Carter AE, AlShwaimi E, Boschen M, Carter G, George R. Influence of culture change on the perception of fear and anxiety pathways in Endodontics: A pilot proof of concept study. *Aust Endod J* 2019; 45(1):20–5.
16. Australian Bureau of Statistics. Australia's Population by Country of Birth. Available at: <http://www.abs.gov.au/ausstats/abs@.nsf/Previousproducts/3412.0Main%20Features32015-16?opendocument&tabname=Summary&prodno=3412.0&issue=2015-16&num=&view=>. Accessed Mar 30, 2017.
17. Kwan SY, Holmes MA. An exploration of oral health beliefs and attitudes of Chinese in West Yorkshire: a qualitative investigation. *Health Educ Res* 1999; 14(4):453–60.
18. Sheiham A. Oral health, General Health and Quality of Life. *Bulletin of the World Health Organization* 2005; 83(9):641–720.
19. Hilton IV, Stephen S, Barker JC, Weintraub JA. Cultural factors and children's oral health care: a qualitative study of carers of young children. *Community Dent Oral Epidemiol* 2007; 35(6):429–38.
20. Australian Bureau of Statistics. 2016 Census QuickStats. Available at: https://quickstats.censusdata.abs.gov.au/census_services/getproduct/census/2016/quickstat/LGA33430. Accessed Jul 24, 2019.
21. Carter A. Development of a Dental Fear Questionnaire: the role of Ethnicity in Endodontic Fear and Anxiety. Gold Coast (Australia): Doctoral Dissertation, School of Dentistry and Oral Health, Griffith University; 2012.
22. Armfield J. The avoidance and delaying of dental visits in Australia. *Aust Dent J* 2012; 57(2):243–7.
23. Rimm DC, Janda LH, Lancaster DW, Nahl M, Dittmar K. An exploratory investigation of the origin and maintenance of phobias. *Behav Res Ther* 1977; 15(3):231–8.
24. Mak AS, Chan H. Chinese Family values in Australia. Available at: <https://hifs.gov.au/publications/families-and-cultural-diversity-australian-family-values-australia>. Accessed Sep 18, 2018.