

A review of occupationally-linked suicide for dentists

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ABSTRACT

Background and objectives: Suicide rates among dentists and a perceived elevated risk for suicide have been debated in the academic literature. It has filtered into the public psyche that dentists have the highest suicide rate of any occupation. The present review seeks support for both protagonist and antagonist positions from multidisciplinary perspectives. Contemporary risk factors and strategies for intervention and the prevention of suicide in dentistry are explored.

Methods: An online database search for articles and reports, with selected target words, was conducted for peer reviewed publications on suicide in the dental profession, and for factors contributing to dentist suicide. Review guidelines from the American Psychological Association were used to clarify concepts, identify where most work was focussed, and to explore the superiority of any approach to the emotive topic over another.

Results: Findings suggest the dominant belief that dentists have an elevated risk of suicide may be historically, but not currently, accurate. Although dentists' suicide is trending down, diversity in methodology means no current consensus is possible. Factors found to be influencing dentists' suicide ranged from known occupational stressors, to toxins and substance abuse, and untreated mental health problems.

Conclusion: The contemporary position in New Zealand shows dentists *per sé* are not more likely than other health professionals to commit suicide although they may have been in the past. Dentists should be aware of individual susceptibility to burnout and mental health problems. Future directions are outlined to address this including peer intervention, and programmes available for dentists to cope better with risks leading to suicide.

The first references commonly cited for dentists having a high suicide rate are Howkins (1935) and Read (1936), and to this day the question of myth versus reality hangs over the profession. Howkins wanted to know whether dentists were dying younger than other professional colleagues, and that prompted him to explore public data for evidence that dental graduates had shortened their lifespan from having chosen dentistry as their profession. Today, searching the combined keywords dentist, suicide and myth, in an accessible search engine such as Google Scholar, generates over 3000 hits, which raises a new question about where one might reasonably start to assess the contemporary situation for New Zealand (NZ) dentists.

Dentists, who were specifically asked during the 2012 NZ occupational stress and job satisfaction study, all reported knowing a colleague who had died by their own hand (Jones, Burmester & Annan, 2013). In the worst scenario, an older dentist reported seven classmates had died this way, but further investigation showed that these occurred in the early 1950s, in the aftermath of WW2 when arguably post-traumatic stress was not well managed; and there was the suggestion that, at that time, nitrous oxide was not uncommonly self-administered for stress relief, and that it had the potential to be fatally abused. The authors asked the NZ Coroner's Court for dentist's suicide statistics, and found that occupation is not always recorded with suicide data. There are some recent data showing death by suicide in the genderless categories of dentist, dental surgeon, and dental technician, but nothing that could add to the understanding of risk or for planning prevention strategies.

The sum of the ambiguities in academic literature, anecdotes from the NZ survey, and lack of data from the NZ Coroner's Court, led the authors to aim to update the current empirical state of knowledge of dentist suicide, by way of a review that paid particular attention to risk factors and coping strategies for self-care, peer support, intervention and prevention. The objective, then, was to examine the key content in dentist suicide literature from 2001 onwards, and provide a critique on commonly used methods to assess suicide rates amongst dentists as well as looking for limitations and methodological weaknesses. Common risk factors and implications will be outlined. Future directions will be presented in a way that can inform individual dentists in self-care, and also dental school training and dentists' professional organisations in providing appropriate education and support.

METHOD

Sample

An initial, author-led, general online database search for peer reviewed journal articles used the combined keywords: "dentists" and "suicide" through the databases Medline, Psycinfo, Psychology and Behavioural Sciences, CINAHL (Nursing and Allied Health Database), Cochrane Library, and Google Scholar. This generated 11 articles. Additional searches by a District Health Board librarian, and a Massey University librarian generated a further seven articles. A final search prior to submission of the reviewed manuscript was confined to 2012-2015 and the terms dentists and suicide and did not generate any further papers, but did identify a letter to the Editor of the British Dental Journal (BDJ) (Papworth, 2014), still expressing confusion over myth or reality of high suicide rates in dentistry.

Selection criteria

- Studies concerning occupational suicide rates, dentists and suicide, risk factors for suicide, and coping strategies for occupational stress and risk factors to prevent/intervene dentist suicide.
- Publications from the past ten years have been given priority

Materials

Articles included seven articles on dentist suicide rates and risk factors, two articles on dentist and physicians suicide rates, and a further three articles which considered suicide rates among health care professionals including dentists. Two articles focused solely on physicians' suicide rates and risk factors that generalised to dentists and four articles examined suicide rates for a range of occupations including dentists. One of these papers indirectly explored the connections between toxins in the dental environment and suicide. (N=18).

Procedure

The review followed general APA guidelines where the starting point was the topic of dentist suicide and what leads to dentist suicide attempts. Definitions and terms were clarified. The pattern of variables or risk factors that have been regularly identified was outlined. Potential flaws were considered. Data were explored for consistency and contradictions. Any apparently superior concepts were highlighted and from them, future directions were suggested.

RESULTS AND DISCUSSION

In relation to the aim to update the current state of knowledge of dentist suicide, the general finding from the reviewed literature was that suicide rates for dentists are inconsistently reported, but that this is unsurprising given the lack of internationally standardised data recording and reporting protocols for deaths attributed to suicide (Bedeian, 1982). However, all is not lost. The present review showed that the most cited reviews of suicide rates for dentists and other health professions from the last 15 years (Alexander, 2001; and Stack, 2001), may be less relevant now with changes in dental technology, dental education, public policy favouring water fluoridation, and different approaches to dental practice (for example, a focus on cosmetic dentistry or the shift away from sole-practise with a concomitant rise in group and corporate practices). Such changes have influenced the variables that mitigate risk, so that to generalise from the present findings, one could argue that risk for suicide in dentistry was once high but is no longer, particularly in NZ; but there is no cause for complacency.

Relatively recent work by Sancho and Ruiz (2010) supported the consensus of inconsistency, on the grounds of methodological discrepancies between studies (discussed later), and that suicide rates calculated from death certificates give a misleading picture as they do not include attempted suicides; plus in different countries a dentist's occupation may be referred to using a range of different labels (as we found with the NZ Coroner's files). When studies are essentially testing the null hypothesis (that there is no relationship between suicide rates and being a dentist), incorrect categorisation, missing data, practice and population differences, can open the way for wrongly rejecting a true null hypothesis, or accepting a false null hypothesis. So although a recent study in Taiwan found that suicide rates for dentists were higher when compared to the Taiwanese general population (Shang et al., 2012), caution is needed in generalising this to NZ dentists without exploring cultural and political variables in dental practice, and how a country's population statistics are captured.

Data in the literature presently reviewed were typically collected from governmental agencies that did record

occupation and cause of death. This was commonly from census information, offices for national statistics (e.g. death certificates), and national mortality and surveillance registries. Several studies used standardized mortality ratios (SMR) to measure the rates of suicide for dentists and the general population; while proportional mortality ratios (PMR) provided a ratio of observed and expected deaths. These expected deaths were based on age specific proportions of death from suicide in the general population (Roberts et al., 2013).

A longitudinal approach was taken in Denmark. This examined suicide among various health care professionals first, rather than make comparisons only with the general population. Hawton et al. (2011) investigated the risk of suicide in dentists, medical physicians, nurses, and pharmacists, over a 26 year period, reporting rates by gender and means of suicide. While health care professionals generally had an increased risk of suicide, and dentists did initially have a statistically significant greater rate than the general population, Hawton et al. reported that the rate for dentists decreased over the study period. Women dentists were the least at risk in the Hawton et al. (2011) study population. Meltzer et al. (2008) had earlier investigated the patterns of suicide by occupation in England and Wales (not limited to health care professions) over a 4 year period from 2001-2005. Their study found, as did Hawton et al. that health care professions had increased rates of suicide and that of the health professionals, male dentists contributed to the high PMR of this particular group.

There are other longitudinal works. A study that examined three separate time periods 1979-1980, 1982-1983, and 2001-2005, in relation to occupation and suicide rates, found that the earliest time period ranked dentists as being the sixth occupation at risk for suicide, with veterinarians and pharmacists (Roberts et al., 2013). However, Roberts et al. found that the recent period of 2001-2005 did not include dentists in the top occupations at risk of suicide. They found a 59% reduction in suicide rates for dentists between 1979-1980 and 1982-1983 and their latest period (2001-2005). A NZ study that investigated suicide rates by occupation, over 30 years, found that dentists did not have elevated rates compared to other occupations such as nursing and farming (Skegg et al., 2010); but it is of interest to draw comparisons between NZ dentists and other occupations that Hawton et al. (2011), and Roberts et al. (2013) specifically mentioned. Agricultural occupations (farmers) and nurses have an elevated risk of suicide, showing some consensus in these three studies' findings.

METHODOLOGICAL ISSUES AND LIMITATIONS OF THE LITERATURE

There are a number of limitations and methodological flaws reported in the literature on suicide rates of dentists. These include failing to control for covariates, limiting samples to working age populations or sub-groups of dentists, possible under-reporting of suicide, regional or localised data over brief periods, and not accounting for changes in professional practice over time.

Petersen and Burnett (2008) outlined methodological flaws in suicide reviews, saying that studies did not control for demographic variables, such as age, gender, and marital status. Most studies in Stack's (2001) review were restricted to white male dentists and did not include data on non-white dentists;

and had limited data from women dentists. How comparable then is this with a study which did control for these variables and found that there was still an elevated risk of suicide for dentists in Denmark (Hawton et al., 2011)? The Hawton et al. study was limited to Danish regional data and compared dentists to teachers' rates and the general population, Alexander (2001) had commented on the use of regional or localised data collected over brief periods as not being representative of long term national prevalence. Vanishree et al. (2011) suggests that more nationwide studies with longer time frames are needed to appropriately and accurately examine dentist suicide statistics.

Letters to the Editor of the BDJ, prior to Papworth's (2014) comment on the lack of evidence for dentists' elevated rates of suicide, and use Stack (2001) and Alexander (2001) as references to these inconsistent findings (Johnson, 2006; Preston, 2006). A letter to the journal Occupational Medicine by Das (2008) commented on the lack of demographic knowledge as an influencing factor on the data reported. Das recommended that dentists' negative life events need to be monitored as a contributing factor to suicide in general.

Under-reporting of suicide has also been raised as an issue for the validity of suicide research. Stack (2001) suggested that this is a result of failure by, or reluctance of, coroners to state the cause of death as suicide. Alexander (2001) and Lange et al. (2012) suggested that this may not only be related to coroners' judgments, but due to the stigma attached to suicide in particular cultures or religions who may refuse to acknowledge death by suicide. Vanishree et al. (2011) claimed that under-reporting could be as high as a third of suicide deaths not being reported as suicide. Under reporting distorts the actual risk of suicidal behaviour amongst dentists, and therefore increases the importance of attending to occupationally-linked mental health problems and prevention strategies.

RISK FACTORS FOR SUICIDE AMONGST DENTISTS

Chemicals and toxins

In a personality-focussed and clinical approach, Murry and Butler (1988) undertook an investigation into all possible harmful chemicals in the dental office, and the effects these products had on dental personnel. Fifty-one dentists or dental assistants who were attending a dental conference were recruited for the study. No control group was recruited; rather neuro-physiological assessment scores were compared with norms. Personality was also assessed. Of the 40% who scored outside expected norms, 18% had very high scores that Murry and Butler suggested reflected the participants being "warm hearted and personable" but with "unhealthy and overriding need for approval from others"; while 27% had very low scores that were interpreted as "indicating a history of unsatisfying interpersonal relationships" (p. 57). The clinical factor analysis showed that 27-30% of the sample had mild to moderate depression, signs of suicidal depression placing them at risk of suicide, increased anxiety, and loss of confidence in their ability to practice. Murry and Butler concluded that there was much to be concerned about from the chemical/heavy metal work environment, stating

Very often symptoms of poisoning will be vague and subjective particularly with low dosage in the early stages of the reaction to toxins, e.g., forgetfulness, tired, irritable, feeling down, weak etc., and the standard medical clinical test will not be adequate to point to the toxicity and its cause (p. 65).

Occupational stress

Occupational stress has been repeatedly reported as a key factor in suicide rates for dentists (Stack, 2001; Alexander, 2001). The term stress incorporates a variety of sources that impact on the development of stress in this profession. Stack attributes dentists' stress to their practice being client dependent and working in isolation, which we know is changing. However, Alexander reports that practicing in isolation is only of minor relevance. Stress is seen as beginning in dental school and continuing into practice (Sancho & Ruiz, 2010; Vanishree et al., 2011). Dentists and other health professionals are reported as being less likely to take regular breaks from their work or to go on vacation (Tyssen, 2007; Vanishree et al., 2011; Lange et al., 2012). Personality traits such as perfectionism may be a risk factor for suicide, however there is little recent support for this either (Vanishree et al., 2011; Wada et al., 2011; Lange et al., 2012).

The development of unmanageable stress can lead to burnout (Johnson, 2006; Sancho & Ruiz, 2010; Shang et al., 2012). The term burnout comes from the seminal work of Christina Maslach, and refers to the emotional exhaustion and lack of energy experienced by individuals who are commonly overloaded with commitments or demands from a particular role, in this case, the demands of being a dentist (Shang et al., 2012). Although dentists may suffer from burnout at lower rates than the general population, those dentists who do suffer from burnout are at a higher risk of suicide (Sancho & Ruiz, 2010).

Patient interactions

Patient interactions that are accompanied by frustration, apprehension, discomfort, fear, and hostility have been found to contribute to the development of stress and depression which may lead to suicide (Alexander, 2001; Wada et al., 2011). This expands on the patient-dentist relationship as stated by Myers and Myers (2004) as being a risk factor for dentists. Myer and Myers (2004) refer to stress in dentists as being a result of the fragility of dentist-patient relationship, time and scheduling pressures, staff and technical problems, and job dissatisfaction. Lange et al. (2012) add that in the UK, dealing with insurance and governmental agencies such as the National Health Service (NHS) are contributing factors to occupational stress. Labovitz and Hagedorn (1971) who reported suicide by occupation (including dentists, doctors, and lawyers) suggested that professions that were client-dependent had higher rates of suicide, because client demands and interactions played a key role in the development of suicidal behaviour. These factors are very similar to the findings of Jones, Burmester and Annan (2013) from the New Zealand job stress survey.

Demographic Variables

Demographic information including, gender, age, ethnicity, marital status, and socio-economic status is important in assessing dentist suicide. Much research on dentist suicide claims demographic variables are the key indicators of suicide risk. Specifically, men have been reported as four times more likely to commit suicide as women (Hawton, 2011). White men are twice as likely to commit suicide as non-white men (Alexander, 2001; Stack, 2001; Sancho & Ruiz, 2010; Lange et al. 2012). Infrequently discussed is that "being alone" is a risk factor for dentists who are divorced, never married, or widowed, and this can be compounded with age. Age has

Table 1 Suicide Summary

Author(s) + Year	Aim	N	Sample	Method(s)
Alexander (2001)	Examine factors around suicide in dentists and other health care workers	N/A	Dentists Doctors Nurses	Literature review
Stack (2001)	Analyse occupation and suicide controlling for demographics	9,499 suicide data	All occupations (Broad range)	Logistic regression analysis
Myers & Myers (2004)	Investigate overall stress, work stress and health in dentists in the UK	2441 sample	Dentists	Survey
Johnson (2006)	Burnout syndrome in dental profession (See Newton et al., 2006)	N/A	Dentists	Letter to the editor (British Dental Journal)
Preston (2006)	Rebuttal letter to Johnson (2006)	N/A	Dentists	Letter to the editor (British Dental Journal)
Tyssen (2007)	Overview of Norwegian and international physicians' health problems and use of health services	96 studies	Doctors	Literature review (focus on The Norwegian Physicians' Survey)
Das (2008)	Response to Petersen & Burnett (2008) article	N/A	Dentists	Letter to the editor (Occupational Medicine Journal)
Meltzer et al. (2008)	Patterns of suicide by occupation in England and Wales compared to previous decades	N/A	All occupations (Broad range)	Death registration data Proportional mortality ratios (PMRs) and Standardised Mortality Ratios (SMRs)
Petersen & Burnett (2008)	Examine suicide risk for dentists and physicians in the USA	N/A	Dentists Physicians	Census data (26 states) Suicide Rate Ratios (SRRs) and Standardised Mortality Ratio (SMR)
Rogers & Malone (2009)	Reviews evidence for stress and practical coping strategies in Ireland	N/A	Dentists	Literature Review
Sancho & Ruiz (2010)	Analyse studies on suicide rates in dentists and identify stressors	N/A	Dentists	Literature Review
Skegg et al. (2010)	Examine suicide by occupation in NZ over 30 year period	940 suicide data	All occupations (Broad range)	Standardised mortality ratios (SMRs)
Hawton et al. (2011)	Compare and examine risk of suicide in health related profession and other professions in Denmark	N/A	Health professions, teachers, and general population	Case control design Danish national registers data
Vansihree et al. (2011)	Analyse literature for dentist suicide in relation to dental activities	N/A	Dentists	Literature Review

Main Findings	Limitations/Considerations
<p>Risks factors: Demographics/ Stress/Access to means/Personality traits/Perceived status/Poor self care/Stigma Coping strategies: Stress Education/Management/Prevention Overall: Inconsistent findings</p>	<p>Suicide underreporting (culture/stigma) Regional data over brief periods Restricted population sample Suicide attempts excluded Dentist practice evolution Validity of sources questionable</p>
<p>Risks factors: Demographics/ Stress/ Access to means/ Personality traits Overall: Inconsistent findings</p>	<p>Suicide underreporting (coroners professionalism) Limited population sample No control for covariates</p>
<p>Risk factors: Stress/Job satisfaction Coping strategies: Increasing overall health (substance use/ sleep/ obesity/ burnout) Overall: Poor health and self care can lead to high stress in dentists</p>	<p>Reliability of self reported questionnaires Longitudinal studies needed</p>
<p>Risk factors: Burnout syndrome Coping strategies: Increasing self care Overall: Reliable data suggests dentists are not suicide prone</p>	<p>Supports Alexander (2001) findings of questionable validity of sources for dentist suicide</p>
<p>Risk factors: Burnout syndrome Coping strategies: Increasing self care Overall: Dentists live longer than general population/die of other causes (not suicide)</p>	<p>Contradicts Johnson (2006) letter citing evidence for increased risk of suicide in dentist is supported by PMRs and larger sample sizes that are more reliable</p>
<p>Risk factors: Poor self care/ Working environment/ Individual factors Coping strategies: Increasing self care and working environment Overall: Inconsistent findings</p>	<p>Restricted sample to physicians not including dentists Supports research aimed at improving self care for doctors to reduce the high prevalence of stress and mental illness</p>
<p>Risk factors: Over worked/ Working environment Coping strategies: Monitoring of negative life events Overall: Early warning signs and interventions warranted for dentists</p>	<p>Supports Preston (2006) letter</p>
<p>Risk factors: Negative life events/ Poor social support Coping strategies: Access to care/ Social interventions Overall: Highest suicide rates are in the health professional and agricultural occupations</p>	<p>PMR may not represent excess suicide rate for occupational group but SMR gives mortality rate for occupation compared to general population No analysis of trends over time</p>
<p>Risk factors: Demographics (Older male dentists and physicians/ female physicians) Coping strategies: N/A Overall: Inconsistent findings</p>	<p>Restricted population sample (similar suicide rate for male physicians to the general population and academics)</p>
<p>Risk factors: Burnout syndrome/ Stress/ Stigma Coping strategies: Early education and recognition of symptoms and stigma /Prevention /Peer support/CBT aimed at dentist stress for anxiety and depression Overall: Important to implement practical interventions and prevention programmes</p>	<p>Sources obtained from surveys</p>
<p>Risk factors: Demographics/Stress/ Burnout Syndrome/ Working environment/ Substance use/ Mercury exposure Coping strategies: Suicide psychoeducation Overall: Further data needed</p>	<p>Need to clarify if factors can be controlled for</p>
<p>Risk factors: Access to means affected the method of suicide chosen by occupation Coping strategies: Prevention and detection of psychiatric disorders/ Stress reduction/ Social support Overall: Contradicted the means to access hypothesis</p>	<p>Census data used to calculate SMRs may be misclassified</p>
<p>Risk factors: Demographics/ Access to means and knowledge about lethal methods Coping strategies: Access to support groups/ Healthy lifestyles Overall: Increased suicide risk for medical related professions compared to teachers and general population</p>	<p>National (Danish) data over 26 years period Psychiatric service contact used as a proxy for psychiatric disorders may be misleading</p>
<p>Risk factors: Poor self care/Exposure to mercury Coping strategies: Stress management/ Communication skills Overall: Inconsistent findings</p>	<p>Suicide underreporting Regional data over brief periods Validity of sources questionable Risk factors not well supported – personality traits and perceived status</p>

Wada et al. (2011)	Examine association between depressive symptoms and suicidal ideation among physicians in Japan	3864 sample	Physicians	Survey
Lange et al. (2012)	Summary of data on dentist suicide compared to other health care professions	N/A	Dentists Physicians	Literature Review
Shang et al. (2012)	Evaluate mortality among dentists in Taiwan	11700 cohort	Dentists	Registry file Taiwan Dental Association Data Standardised Mortality Rates (SMRs)
Roberts et al. (2013)	Compare suicide rates across all occupations in Britain		All occupations (Broad range)	Census based data for population and deaths Standardised Mortality Rates (SMRs) Proportional Mortality Ratios (PMRs)

been examined in relation to suicide among dentists, where a trend has been found for older dentists committing suicide compared to younger dentists (Petersen & Burnett, 2008). Religion, the cohesiveness of the community in which a dentist is working, and the state of the economy, influence suicide rates across any population, and would be expected to be reflected in dentistry too, but there is little written on this.

Several studies have listed the availability and access to means of suicide as another risk factor (Alexander, 2001; Stack, 2001; Roberts et al., 2013). Dentists, medical doctors, and in the NZ context, farmers, have been reported to have access to means of suicide and may be more knowledgeable about lethal methods than other occupational groups. Opportunity for suicide was assessed over a 30 year period in NZ in which dentists were found not to have increased risk of suicide due to availability of means to suicide whereas nurses, pharmacists, and hunters were (Skegg et al., 2010). The access to means, as a risk factor, extends to the ability to abuse poisonous substances (Shang et al., 2012). In dental practice this included nitrous oxide, but this has anecdotally been largely overcome by controlled gas mixes such as Entonox®, although not all NZ dental practices have only Entonox¹.

IMPLICATIONS

Whether or not the findings of dentist suicide studies are consistent or inconsistent, the issue of suicide in general remains. There have been a number of interventions and prevention strategies recommended in the literature aimed at educating and reducing suicide amongst dentists. A common consensus is that stress management and communication skills need to be taught in dental school (Sancho & Ruiz, 2010; Vanishree et al., 2011). Awareness through psycho-education around suicide is advocated in public health initiatives (for example, the New Zealand Ministry of Health's Suicide Prevention Strategy 2006-2016) (Associate Minister of Health, 2006). This includes the importance of recognising symptoms, addressing the stigma, and providing peer support or mentoring (Alexander, 2001; Roger & Malone, 2009).

Myers and Myers (2004) suggest that increasing dentists' overall health would also reduce the risk of mental health issues and suicidal behaviours. Their study found that a third of dentists were physically unfit and the majority of their

sample suffered to some extent from anxiety, depression, sleeping problems, and/or substance abuse issues. Others have recommended psychological therapy aimed to reduce stress, anxiety, and symptoms of depression (Lange et al., 2012; Rogers & Malone, 2009). As a last resort antidepressant medication has also been suggested to address those who are struggling with anxiety and depressive symptoms (Lange et al., 2012).

The current psychological position on dentist suicide recognises the numerous risk factors and stressors that may lead dentists to become burnt out, mentally unwell, or attempt suicide (Skegg et al., 2010; Lange et al., 2012). There is agreement that coping strategies and prevention programmes need to be implemented in both the dental work force and in dental schools, in order to reduce risks related to suicide among dentists (Alexander, 2001; Roger & Malone, 2009; Sancho & Ruiz, 2010; Vansihree et al., 2011). This is most strongly supported by Brondani, Ramanula, and Pattanaporn (2014) who reported a longitudinal study from University of British Columbia Faculty of Dentistry where a module of managing stress and suicide prevention was included in the curriculum and over 500 students' self-reflections were analysed, showing students were uncomfortable with the material but considered it important. The authors of that study were not able to show if knowledge translated into self-care after the students graduated.

NZ has a national suicide prevention strategy (Associate Minister of Health, 2006) and a vision of society where people feel valued and in turn hold life as a high value. It states that in principle "everyone has a role in suicide prevention" (p. 13) and that strategies should be evidence based. In the dental context this may require a more open attitude towards signs of mental illness and, as has been outlined in Jones and Annan (2013), dentists need to be prepared to start conversations with colleagues who they notice are not thriving².

CONCLUSION

This review of dentist suicide literature has identified risk factors that are currently relevant for dentists, and outlined

¹ Pers. Comm. Dr Jeff Annan May 2015.

² Suicidality is closely associated with mental illness, particularly depression; and there is a strong stigma attached to mental illness. Public health initiatives such as www.depression.org.nz advocate a more open approach to depression. Specific dos and don'ts for suicide can be found online in sites such as www.save.org

Risk factors: Personality traits/ Patients interactions/ Stigma Coping strategies: Organised support systems Overall: Patient interactions (unreasonable demands/ complaints) should be addressed through hospital support systems to prevent the development of mental health disorders in physicians	Validity of self reported questionnaires Unable to adjust for factors associated with depression among physicians Need to consider pre existing depressive symptoms of physicians and their vulnerability and their interpretative of unreasonable demands
Risk factors: Demographics/Stress/ Poor self care/ Stigma Coping strategies: CBT aimed at stress for anxiety and depression related symptoms Overall:	Suicide underreporting Risk factors not well supported – personality traits
Risk factors: Burnout syndrome/ Substance use Coping strategies: N/A Overall: Mortality in dentists was more likely heart disease and drowning	Population sample (older cohort) Overestimation of time spent in practice resulting in possible overestimation of mortality risk Drowning's were suspected suicides (misclassification bias)
Risk factors: Access to means/ Social isolation/ Personality traits Coping strategies: Access to means prevention/ Mental health promotion and suicide prevention initiatives/ Access to care and support/ Increase awareness Overall: Increased impact of occupational socioeconomic risk factors	Censuses data over 30 year period Restrictions for SMRs and PMRs during 30 year period was also evident Socioeconomic changes over time may be stronger determinant of occupational suicide risk

methodological limitations in the literature. The core question – myth or reality–remains unanswered by empirical data, but the present review does show that the relationship between dentists and suicide is most likely trending downwards. Compared to the general population of Western countries and to other health care professionals, contemporary dentists appear to have a relatively low risk of suicide. Other occupations that appear to be more at risk include farmers and manual labour workers, where the means of causing death are arguably more lethal and available. However, the importance of awareness and education around suicide for any occupation is an essential factor in prevention. Suicide risk includes many variables, so to be constructive, a future focus should be on prevention, with raising awareness of mental health signs and symptoms beginning in dental schools. As the practise of dentistry changes, so a culture of occupational safety is needed to mitigate risk. NZ dentists are encouraged by their professional body, the NZ Dental Association, to build strong mentoring networks, and social support (Jones & Annan, 2013). However, for burnout and mental health problems, the key message from this review is for NZ dentists is to reach out and to be prepared to start a conversation with a colleague if stress, anxiety or depression seems to be affecting their behaviour and enjoyment of practise.

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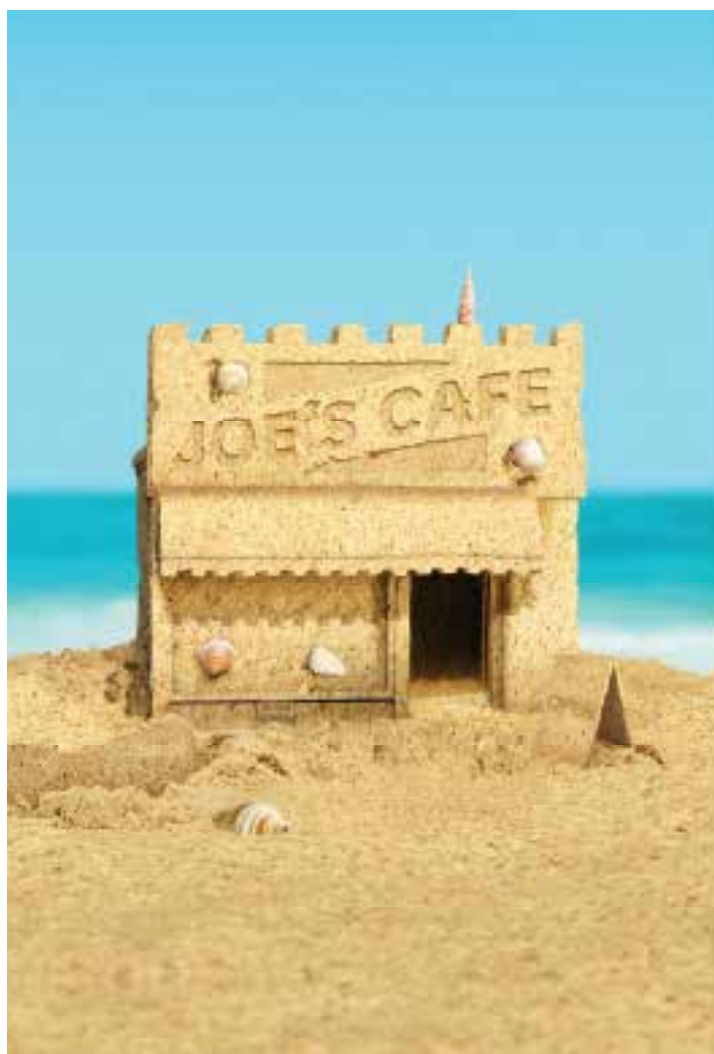
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