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ORIGINAL ARTICLE

Self-perceived halitosis and related factors among adults residing in Riyadh, Saudi Arabia. A cross sectional study

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KEYWORDS

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Abstract *Objectives:* This cross-sectional observational study was conducted to determine the prevalence of self-perceived halitosis among adults in Riyadh, Saudi Arabia and to assess the relation of halitosis with some socio-demographic factors, oral habits and health practices.

Materials and methods: A questionnaire was distributed to randomly selected subjects including senior high school students, college students and employees working in governmental offices. High schools and governmental offices were selected using systematic random sampling from each of the main five regions of Riyadh. The college students were selected from the major universities in Riyadh. One hundred questionnaires were randomly distributed in each of the 15 locations for males and 15 for females (5 schools, 5 universities and 5 governmental offices for each gender) giving a total of 3000 questionnaires.

Results: The prevalence of self-perceived halitosis was 22.8% among the participants. The majority of the subjects with self-perceived halitosis experienced bad breath on waking up (83.5%). Nearly half of the sample with self-perceived halitosis was told by others that they had bad breath, 25.8% visited a doctor regarding that, 23.8% received treatment for their bad breath and 54.1% made trials to control their problem by using some aids. Self-perceived halitosis was found to be more prevalent among males compared to females ($P < 0.000$), whereas, no statistically significant differences were found among the different age groups ($P = 0.317$). A statistically significant relationship was found between self-perceived halitosis and times of mouth cleaning, use of tooth brush, use of tooth paste, tongue cleaning ($P < 0.000$), and the use of dental floss ($P = 0.004$). A statistically significant relationship was also found between self-perceived halitosis and shisha ($P < 0.000$) and cigarette smoking ($P = 0.045$).

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Conclusion: The prevalence of self-perceived halitosis among the population in Riyadh is within the range reported in other countries. Self-perceived halitosis is related to gender, inadequate oral hygiene practices and cigarettes and shisha smoking however, it is not related to age.

1. Introduction

Halitosis, also known as malodor, is a common oral health condition throughout the world (ADA Council on Scientific affairs, 2003; Hughes and McNab, 2008; Bornstein et al., 2009). It is a term used to define the presence of unpleasant or offensive breath emitted consistently from a person's mouth (Hughes and McNab, 2008; Bornstein et al., 2009; Settineri et al., 2010).

Halitosis has a complex etiology with extrinsic and intrinsic causes. Extrinsic causes include tobacco, alcohol, some medications and certain odoriferous foods, such as garlic and onion (ADA Council on Scientific affairs, 2003; Bornstein et al., 2009). Intrinsic causes may be related to both systemic and oral conditions, but a large percentage of cases, about 80–90%, are generally related to oral causes (ADA Council on Scientific affairs, 2003; Bornstein et al., 2009). Systemic conditions may include respiratory tract conditions such as chronic sinusitis, tonsillitis and bronchitis, diabetes, hepatic and renal disorders (ADA Council on Scientific affairs, 2003; Settineri et al., 2010). Oral causes are related to poor oral health care, dry mouth, deep carious lesions, periodontal diseases, oral infections, pericoronitis, mucosal ulcerations, impacted food or debris and, mainly, tongue coating (Bornstein et al., 2009; Settineri et al., 2010; Liu et al., 2006; Lee et al., 2007).

Halitosis can be clinically classified into three groups; Real (Genuine) halitosis which can either be physiologic (eg. morning halitosis) or pathologic (oral or extra-oral halitosis), or Pseudohalitosis, where there are complains of halitosis without its actual existence, and Halitophobia where people fear that they have halitosis (Madhushankari et al., 2015). A number of methods have been used to detect the presence of halitosis either directly or indirectly. The most commonly used diagnostic methods include organoleptic (hedonic) measurement, gas chromatography, sulfide monitoring, the BANA test, and the use of chemical sensors (Aylikci and Colak, 2013).

Halitosis may have major social impacts for the sufferers and significant effects on their normal daily life activities, such as communicating with others and social and professional interactions. It may also affect the individual's self-esteem and confidence, cause embarrassment and reduce employment and carrier opportunity and decrease the quality of life (Eli et al., 2001; Azoda et al., 2010, 2011). Several studies were conducted to evaluate self-reported halitosis among the population. The prevalence of self-reported halitosis in Kuwait was found to be 23.3% among adults, 19.4% among Italian subjects aged 15–65 years, 32% among subjects from the city of Bern, Switzerland, 61.1% among Thai dental patients, and 62.8% among patients visiting periodontal clinics in China (Bornstein et al., 2009; Settineri et al., 2010; Al-Ansari et al., 2006; Youngnak-Piboonratanakit and Vachirarojpisan, 2010; Wang et al., 2010).

In Riyadh, data on self-reported halitosis and related factors among adults are considered to be rare. This study will help to identify the magnitude of this problem and plan for proper management practices, since management of halitosis requires proper investigations, diagnosis and identification of causal factors involved in the etiology of the condition.

So the aims of this present study are:

- To determine the prevalence of self-perceived halitosis among adults in Riyadh, Saudi Arabia.
- To assess the relation of halitosis with some socio-demographic factors and oral habits and health practices.

2. Materials and methods

This cross-sectional observational study was conducted during the period from February to July 2012. Ethical approval was obtained from the College of Dentistry Research Center, King Saud University, Riyadh, Saudi Arabia.

A specially designed self-administered questionnaire was developed in English then translated to Arabic. To ensure the validity of the questionnaire, a pilot study was done on 150 people who were not included in the study to ensure the feasibility and practicality of the questionnaire and modifications were done accordingly.

The questionnaire was made up of 3 parts. The first part was related to some socio-demographic factors including gender, age, educational level and occupation. The second part was related to the participant's perception of any malodor (halitosis) and its history and social effects. The third part was concerned with some oral hygiene and health habits. The questions called for a yes/no and sometimes don't know answers. A tick box layout was used for the provision of the appropriate answer.

The questionnaire was distributed to randomly selected subjects including senior high school students, college students and employees working in governmental office (1000 subjects from each; 500 males and 500 females). The selection of high schools and governmental offices was done using systematic random sampling from each of the main five regions of Riyadh (East, West, North, South, and Central). The college students were selected from the 4 major universities for males and females in Riyadh which were, King Saud University, Al-Imam Mohammad Ibn Saud Islamic University, Prince Sultan University, and AlYammamah Private University in addition to Princess Nora Bint Abdulrahman University for female students and AlFaisal University for male students giving a total of 5 universities for males and 5 for females. The sample size for each level of location within gender level and level of occupation was calculated to be at least 100, giving a total of 3000 questionnaires ($5 \times 2 \times 3 \times 100$).