

The perceived oral health status, practices, knowledge and periodontal status of pregnant women in a maternity hospital in Trinidad

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Abstract

Background The effects of physiological changes that occur during pregnancy on oral tissues have been well documented. The oral health status, practices, knowledge and periodontal status of pregnant women has not been studied before in Trinidad. The aim of this study is to report that of pregnant women in a maternity hospital in Trinidad.

Methods A descriptive oral health survey involving a self-administered questionnaire was undertaken from a convenience sample of pregnant women who attended a maternity hospital in Trinidad. A simple oral health examination took place at the School of Dentistry clinic. Data included education and employment status, medical and dental history, frequency and reason for dental attendance, and the patients' perceived oral health status, knowledge and practices. Examination included the Basic Periodontal Examination (BPE). Data were analyzed using SPSS version 24.0 and ethical approval was obtained by the University of the West Indies Campus Ethics Committee.

Results One hundred and sixty one pregnant women participated and 79.5% were between the ages 26 to 45. Fifty seven per cent attended high school and 58.1% were employed. Nearly 60% rated their oral health as average or good. The majority of women (91.9%) did not attend the dentist routinely. Almost half (46.0%) of the participants said safety concerns with dental treatment during pregnancy would prevent them from seeking care. 54.7% said the cost of dental treatment would act as a barrier to care. The majority had good oral health knowledge for flossing (97.5%) however 37.3% thought that dental care should be avoided during pregnancy unless it was an emergency. Nearly 60% had some form of periodontitis mild (34.2%) or moderate to severe (25.2%). Significant associations found between level of education and brushing, and also between age and smoking, use of mouthwash and BPE.

Conclusions Although oral health knowledge in areas of tooth brushing, flossing and need for attending the dentist was good, in other areas there were serious misconceptions such as dental care should be avoided during pregnancy. Understanding oral health needs of pregnant women can guide oral health promotion and delivery of preventive care and potentially improve pregnancy outcomes.

Background

The effects of the hormonal changes that occur during pregnancy on the oral tissues have been well documented over time. The physiological state of pregnancy has been associated with gingival changes which are comparable to changes in vaginal and other mucosal tissues during gestation (Silk et al, 2008). The microvasculature of the gingiva changes during pregnancy due to increasing levels of progesterone (Laine, 2002; Sooriyamoorthy and Gauer, 1989). Additionally, the dental hard tissues such as enamel are susceptible to

increased gastric acid exposure due to morning sickness and increased vomiting especially in the first trimester among pregnant women (Cohen et al, 1969).

Gingivitis is common in the adult population and the prevalence of periodontitis is reported to be 10-15% (Papapanou, 1996). The prevalence of oral disease in pregnancy is about 44% (Silk et al, 2008; Jain and Kaur, 2015). There is no prevalence data on periodontal disease in the general population in Trinidad and Tobago but it has been reported to be over 67% in a diabetic population in that country (Balkaran et al, 2011).

There is an association between gum disease (gingivitis and periodontitis) and adverse pregnancy outcomes such as low birth weight and premature births (George et al, 2011; Shub et al, 2009). However, many pregnant women are unaware of this (Harris, 2017; George, 2013) and do not often seek dental treatment during pregnancy (George et al, 2010). It has been recognized that maintaining oral health during pregnancy is an important public health issue worldwide and as such it is now recommended that all women should receive a comprehensive oral health evaluation and risk assessment during pregnancy (AAPD, 2011; CDA, 2010). Pregnancy has been described as a powerful "teachable moment" for the promotion of health as expectant mothers are especially keen on their baby being born healthy. Dentists can therefore seize the opportunity to fulfill their roles as educators and health promoters during this physiological state. (Dharmashree, 2018).

The oral health status, practices, knowledge and periodontal status of pregnant women has not to the best of our knowledge been studied before in Trinidad and Tobago and this study aims to provide epidemiological data on this subject with an aim to guiding oral health promotion programmes. This will assist in the delivery of preventive care to expectant mothers and potentially improve pregnancy outcomes in Trinidad and Tobago and the

wider Caribbean region. The aim of this study is to report the oral health status, practices, knowledge and periodontal status of pregnant women in a maternity hospital in Trinidad.

Methods

A convenience sample of pregnant women who attended the antenatal clinic in Mount Hope maternity clinic during the period of data collection (January to December 2018) was undertaken. All women who were pregnant and sought health care at that maternity hospital were invited to participate in a descriptive oral health survey involving a self-administered questionnaire and a simple oral health examination at the University of the West Indies (UWI), School of Dentistry clinic, Mt. Hope. Exclusion criteria were males and women who were not pregnant at the time of examination. The population consisted of 300 consecutive patients, however, at the end of the period of data collection, the sample size was 161 participants. The reason for non-participation was not ascertained, however some women were no longer pregnant at the time of presentation for screening and therefore their examinations and questionnaires were excluded from the final data analysis. Oral examinations were performed by two examiners who had previously been trained and calibrated.

Demographic data such as age group, self-reported ethnicity, highest qualification achieved and employment status, medical and dental history, frequency, reason for dental attendance were determined from a self-administered questionnaire. The patients' perceived oral health status, knowledge and practices were also determined in the self-administered questionnaire, which was a previously administered questionnaire modified for our population. Examination involved extra-oral assessment, the patients' visible plaque score using the plaque index of Silness and Løe and the Basic Periodontal Examination (BPE), to determine the periodontal health status.

Guidelines of the Silness and Løe plaque index were followed using the criteria of using 4 surfaces of the 6 selected teeth. There was no substitution for any missing tooth, wisdom teeth were excluded. All surfaces were selected, the scores from the four areas of the tooth were added and divided by four in order to obtain the plaque index (Silness and Løe 1964) for the tooth; the following scores were used:

0 No plaque

1 A film of plaque adhering to the free gingival margin and adjacent area of the tooth, which cannot be seen with the naked eye, only by using disclosing solution or by using probe.

2 Moderate accumulation of deposits within the gingival pocket, on the gingival margin and/ or adjacent tooth surface, which can be seen with the naked eye.

3 Abundance of soft matter within the gingival pocket and/or on the tooth and gingival margin.

The Basic Periodontal Examination (BPE), also known as Periodontal Screening and Recording (PSR) Index, is a screening tool for periodontal treatment needs, which identifies the presence or absence of disease (Corbet 2012). BPE criteria and coding were based on that described by Corbet 2012 (Table 1). Firstly, the mouth was divided into six sextants, only sextants with two or more teeth present were used, all third molars and root remnants were excluded and the highest score was recorded for that sextant. The BPE score was determined using a World Health Organisation/ Community Periodontal Index of Treatment Needs probe periodontal probe (British Society of Periodontology 2011). The probe was used to detect bleeding and loss of attachment around the teeth, as well as bone loss between the roots of the teeth (furcation involvement). All patients who had any conditions which required urgent care were identified, the patients were informed and offered treatment at the UWI dental school emergency clinic and polyclinic.

Data were analyzed using SPSS version 24.0 in which descriptive analysis, including cross tabulations, were performed. Inference on the cross tabulations was performed, using chi-square tests to test for general associations. The level of significance used was 0.05.

Ethical approval was obtained by the University of the West Indies Research Ethics Committee and written, informed consent was obtained from each patient prior to the oral health survey.

Results

Socio- demographics

79.5% of pregnant women in this study were between the ages 26 to 45. 34.8% were of Afro- Caribbean descent, 27.3% were Indo- Caribbean and 36.0% were mixed. 57.1% had attended high school and 23.6 % had attended University. 58.1% of the participants were employed. 50.9% were in their 2nd trimester of pregnancy and 82.6% stated that it was not their first pregnancy. (Table 2).

Perceived Oral Health Status

Over two-thirds of the respondents in this study (69.1%) rated their oral health as fair or average. The majority (85.1%) reported having at least one or more problems with their oral health. Just over a third (34.25%) reported experiencing toothache and approximately two thirds (65.2%) reported having cavities. Almost half (47.2%) said that they were experiencing sensitivity and a quarter of the women (25.5%) had a problem with the appearance of their teeth. 67.5% of the respondents indicated that their oral health problems sometimes affected their ability to eat as well as their overall general health. 68.9% of participants felt that oral health is extremely important when compared to general health. (Table 3).

Oral Health practices

The majority of women (87.6%) did not have a dentist, most (91.9%) did not attend the dentist routinely and three quarter of them (74.8%) only attended when they had a problem. Only 17.4% reported having been to dentist within the last year. The most common reason for the last dental visit was pain (35.4%). Almost half (46.0%) of the participants said concerns regarding safety of dental treatment during pregnancy would prevent them from seeking care. 54.7% said the cost of dental treatment would act as a barrier to care. Only 19.3 % of patients did not have time for seeking dental treatment. Conversely 94.4 % taught oral health was a priority and only 9.3 % were advised by antenatal care providers not to seek dental treatment.

77.6% reported that they brushed their teeth at least twice a day. The majority of women used fluoridated toothpaste (91.9%) regularly and less than half used mouthwash (48.1%). Only 29.4% of participants reported that they flossed on a regular basis. Only 3% of patients used Sugar free gum. (Table 4).

Oral health knowledge

The majority of respondents in his study (97.5%) believed that daily flossing should be done to clean in between teeth and a similar number (98.1%) thought that routine visits to the dentist could help keep teeth and gums healthy. Despite this, (37.3%) thought that dental care should be avoided during pregnancy unless it was an emergency. The majority (80.4%) felt that cavities could not be spread form the mother to the baby's mouth and 73.3% did not believe that a mother's poor oral health could contribute to low birth weight (LBW) babies. Almost a third of the participants (32.3%) did not believe that "sleeping with a bottle containing formula could cause holes on a baby's teeth." The majority (88.8%) had positive views on baby teeth but only 17.4% felt that the baby's first dental visit should be by one year of age or earlier. 96.9% of respondents were aware that if a pacifier fell on the

floor, it was not good for the mother to put it in her mouth to clean it before placing it back in baby's mouth. (Table 5).

Another important finding of this study was that 8.1% of the expectant mothers were smokers.

Periodontal status

Only 3.7% of pregnant mothers had no plaque, while 39.8% had mild plaque and 56.5 % had moderate to heavy plaque levels. Only 3.1% had BPE code 0 meaning healthy periodontium, while 6.8% had code1 indicating gingivitis. Nearly one-third (30.4%) had code 2 meaning gingivitis with local risk factors. 34.2 % had a BPE code of 3, which meant mild periodontitis and over a quarter of pregnant mothers (25.5 %) had a BPE of 4 which meant moderate or advanced periodontitis. (Table 6). Only 5% of the respondents had a denture of which a quarter of them (25%) kept it in at night.

When investigating oral health practices, no associations were observed with ethnicity, level of employment or when last the women visited the dentist versus brushing, flossing and use of mouthwash. However, there were significant associations found between age and the use of mouthwash ($p=0.027$), and between education and brushing ($p=0.03$). Tables 7,8.

In terms of oral health knowledge, there were no associations with age, ethnicity, education or level of employment but there was a significant association between age and smoking ($p=0.008$). Table 9. With respect to the periodontal status of the women there was a significant association between BPE and age ($p=0.030$) (Table 10) and BPE and ethnicity ($p=0.013$) (Table 11) but no association was observed for education or level of employment with BPE.

Discussion

This study sought to provide knowledge of the periodontal status of pregnant women in Trinidad along with their perceived oral health status, practices and knowledge. No previous data exists for this population.

Perceived oral health status

Over 62% of the pregnant women rated their oral health as good or very good and over one-third (37.7%) as fair or average. This is very similar to the findings of Keirse et al, 2010 but is lower than that reported in George et al, 2013 where 54.4% reported fair or average oral health status. This study also found higher levels of toothache reported (34.3%) and cavities (65.2%) than found in another study with 16.9% and 41.5% respectively (George et al, 2013). It was gratifying to note that 68.9 % of participants felt that oral health is extremely important when compared to general health and this is higher than another study that reported 46.5% (George et al, 2013).

Oral health practices

It has been documented that pregnant women are hesitant to take up dental treatment (Al-Habashneh, 2005; Saddki et al, 2010) and the findings from this study show that over 90% did not attend the dentist and nearly 75% only when they had a problem. This is similar to other studies in Nepal where over 88% of participants had never visited a dentist and most often attended for toothache (55%) or caries (62%) (Erchik, 2019). In our study only 17.4% reported having been to a dentist in the last year and this is very low compared to other studies that reported 45.6% (George et al, 2013) in Adelaide, Australia and some studies in the USA that have shown that less than half of women attend for dental treatment during pregnancy (Al-Habashneh, 2005; Mangskau et al, 1996; Lydon-Rochelle et al, 2004). In Adelaide Australia, it has been reported only 30-35% attend during pregnancy (Keirse, 2010; Thomas, 2008). In the UK under the National Health Service dental treatment is free for pregnant women and up to one year post partum. Yet a study on immigrant mothers in

North London found attendance rates of 32% (Hullah et al, 2008). Other studies done in rural communities in India (Gupta, 2016) and Nigeria (Lasisi, 2018) also found very low attendance for dental treatment during pregnancy. No association was found with when the women last visited a dentist and brushing, flossing, use of mouthwash or BPE and this is most likely because so few women had dentists and the numbers were too low.

This low uptake of dental services could be due to cost which nearly 55% said in this study was a barrier to accessing care. This is agreement with other studies documenting cost as a significant barrier for accessing care (CDA, 2010; Thomas et al, 2008; BMC Child Birth; Keirse, 2010). Also almost half of the participants were also concerned about safety during dental treatment and that would prevent them from seeking care. This concern found in the Trinidad cohort has also been shown elsewhere in the USA (CDA, 2010) and Australia (George et al, 2010; George, 2013). However, in this study most participants did have good oral health practices with over three-quarters (77.6%) reporting they brushed their teeth twice daily and the majority using fluoridated toothpaste (91.9%) and this is similar to other studies (George, 2013, Keirse, 2010; Thomas, 2008). Xylitol decreases the incidence of dental caries by increasing salivary flow and pH and reducing the number of cariogenic (*Mutans Streptococci*) and periodontopathic (*Helicobacter pylori*) bacteria, plaque levels, xerostomia, gingival inflammation, and erosion of teeth (Nordblad et al 1995; Nayak et al 2014).

Oral health knowledge

Pregnant women have good knowledge on flossing daily (97.5%) and attending routinely to the dentist to keep gums and teeth healthy (98.1%). However, there was very poor oral health knowledge in other areas and of concern was that 37.3% felt dental care should be avoided during pregnancy. This misconception has been reported in other studies around the world (Dinas et al, 2007; Mangskau et al, 1996; Saddki et al, 2010; Lydon-Rochelle et al, 2004). The majority (80.4%) also had the false impression that cavities could not be spread from the mother to the baby's mouth and nearly three-quarters (72.3%) did not

believe that a mother's poor oral health could contribute to low birth weight (LBW) babies. These incorrect beliefs were high in this population compared to another study (George et al, 2013). It is clear that there is great scope for improving increased awareness of oral health during pregnancy in Trinidad.

Smoking in pregnancy is associated with increased risks of miscarriage, stillbirth, prematurity, low birth weight, perinatal morbidity and mortality, neonatal and sudden infant death, infant respiratory problems, poorer infant cognition and adverse infant behavioral outcomes (Cnattingius, 2004) and a significant reduction in birthweight has been associated with maternal smoking, as well as an increased risk of low birthweight and preterm birth (Andriani and Kuo, 2014). The odds ratio (OR) for the association between self-reported maternal smoking during pregnancy and asthma in logistic regression adjusted for confounders was 1.28 (Moradzadeh et al 2018). Yet 8.1% of the pregnant mothers in this study were smokers. The literature shows that internationally, large numbers of pregnant women smoke, with rates between 12% and 22% in high-income countries (Tong et al, 2013).

Periodontal status

Only 3.1% of pregnant mothers had periodontal health, while 37.2% demonstrated gingivitis. However nearly 60% of pregnant mothers had some form of periodontitis either mild (34.2%) or moderate to severe (25.2%). Erchick et al, 2019 also reported 40% prevalence of gingivitis in pregnant mothers but few women had signs of probing depths >3mm which is in contrast to the findings of this study. Other studies have found high prevalence of periodontal disease in pregnant women such as Gupta and Acharya, 2016 (95%), Miyazaki et al, 1991 (95%) and Jago et al, 1984 (84%) and more recently Gonzalez-Jaranay et al, 2017. Understanding oral health needs of pregnant women can

guide oral health promotion and delivery of preventive care and potentially improve pregnancy outcomes.

Limitations of this study include the periodontal health status of this population of pregnant patients may not be as evenly distributed in the general population as it was in this convenience sample. Also there may have been bias in the self-reported oral health assessment and his study did not determine the number, if any, of patients with gestational diabetes.

Conclusions

This study found that nearly 60% of the pregnant women rated their oral health as average or good however over 37% had gingivitis and nearly 60% had some form of periodontitis. The majority (nearly 90%) did not have a dentist or attend the dentist routinely. Over half of them (55%) said cost was a barrier to care. Although oral health knowledge in areas of tooth brushing, flossing and need for attending the dentist was good, in other areas there were serious misconceptions such as dental care should be avoided during pregnancy and that a mother's poor oral health did not contribute to low birth weight (LBW) babies. There were significant associations found between level of education and brushing, and also between age and smoking, use of mouthwash and BPE.

Abbreviations

BPE: Basic Periodontal Examination, UWI: The University of the West Indies, LBW: low birth weight

Declarations

Ethics approval and consent to participate

The study has received ethical approval from the Campus Ethics Committee, The University of the West Indies (CEC 242/07/17). Informed consent to participate in the study was

obtained from all participants before the study was carried out.

Consent for publication

Not applicable

Availability of data and materials

All data generated or analyzed during this study are included in this published article.

Competing interests

The authors declare that they have no competing interests

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None

Authors contributions

RR initiated the research idea, developed the research design, wrote the introduction and discussion of the manuscript, contributed to the intellectual content, interpreted the data findings and drafted the manuscript and helped in the critical revision of the manuscript. VR helped in developing the research design and wrote the results of the manuscript, helped in the drafting and critical revision of the manuscript. RB collected and inputted all the data related to the study and wrote the methods section and conducted the statistical analysis and helped in the critical revision of the manuscript. AK helped in drafting the

results and reviewed the initial draft of the manuscript. AB contributed to writing the introduction and reviewing the manuscript. CR administered the questionnaire and collected the clinical data. RYL administered the questionnaire and collected the clinical data. All authors reviewed and approved the final draft of the manuscript and agreed to be accountable for all aspects of the work.

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Tables

Table 1: Summary of codes used in BPE and their clinical description (Corbet, 2012)

Code	Examination Findings	Clinical Condition
0	No pockets exceeding 3mm, no calculus or overhangs and no bleeding on gentle probing	Healthy Periodontium
1	Coloured band remains totally visible, indicating no pockets exceeding 3 mm, no calculus or overhangs but bleeding present on gentle probing	Gingivitis
2	Coloured band remains totally visible, indicating no pockets exceeding 3 mm, but calculus or other plaque –retentive factors found at or below the gingival margin, with or without bleeding on probing	Gingivitis or plaque retention factors
3	Coloured band on probe remains partially visible when inserted into the deepest pocket, indicating pocket depths greater than 3.5mm but less than 5.5-6 mm	Mild Periodontitis
4	Coloured band on the probe covered by gingiva, indicating a pocket of at least 6mm in depth	Moderate to severe Periodontitis
*	Attachment loss at any site is 7 mm or greater, furcation involvement.	Severe Periodontitis

Table 2: Socio-demographic Information and obstetric characteristics of participants (n=161)

Characteristics	Frequency (%)
Age	
15-25	32 (19.9)
26-35	98 (60.9)
36-45	30 (18.6)
46 and over	1 (0.6)
Ethnicity	
Afro-Caribbean	56 (34.8)
Indo-Caribbean	44 (27.3)
Chinese	1 (0.6)
Mixed	58 (36)
Caucasian	1 (0.6)
Other	1 (0.6)
Highest qualification achieved	
Primary School	16 (9.9)
High school Education	92 (57.1)
University	38 (23.6)
Vocational training	15 (9.3)
Current employment status	
Unemployed	67 (41.9)
Employed part-time	16 (10)
Employed-full time	76 (47.5)
Period of gestation	
1st	25 (15.7)
2nd	81 (50.9)
3rd	53 (33.3)
Is this your first pregnancy?	
Yes	28 (17.4)
No	133 (82.6)

Table 3 : Perceived oral health status of pregnant women (n= 161)

Variables	Frequency (%)
Oral health status	
· Excellent	7 (4.4)
· Good	25 (15.7)
· Average	67 (42.1)
· Fair	43 (27.0)
· Poor	17 (10.7)
Self-reported oral health problems	
· None	24 (14.9)
· One problem	44 (27.3)
· Two or more problems	93 (57.8)
Type of oral health problems	
· Bleeding gums	60 (37.3)
· Toothache	55 (34.2)
• Loose teeth	16 (9.9)
• Cavities	105 (65.2)
• Sensitivity	76 (47.2)
• Teeth don't look right	41 (25.5)
Dental problems affected what to eat and overall health in general	
· Often	19 (11.9)
· Sometimes	108 (67.5)
· Never	33 (20.6)
Importance of oral health when compared to overall health	
· Not important	0 (0)
· Neutral	2 (1.2)
· Important	48 (29.8)
· Extremely Important	111 (68.9)

Table 4: Oral Health Practices (n=161)

Variables	Frequency (%)
Do you have a dentist currently?	
· Yes	20 (12.4)
· No	141 (87.6)
Do you attend the dentist for routine care?	
· Yes	13 (8.1)
· No	148 (91.9)
Do you attend the dentist only when you have a problem?	
· Yes	119 (74.8)
· No	39 (24.5)
When was the last time you saw a dentist?	
· <6 months	10 (6.2)
· 6 to <12 months	18 (11.2)
· 1yr to < 2 years	33 (20.5)
· 2yrs to <5 years	42 (26.1)
· 5 years	33 (20.5)
· Never visited	25 (15.5)
What was the reason for your last dental visit?	
· Pain	57 (35.4)
· Filling	42 (26.1)
· Cleaning	31 (19.3)
· Checkup	17 (10.6)
· Other	22 (13.7)
What would prevent you from seeking dental treatment, if any?	
· Safety concerns regarding treatment during pregnancy	74 (46)
· Dental costs	88 (54.7)
· Time constraint	31 (19.3)
· Oral health not seen as a priority	9 (5.6)
· Advised by antenatal care providers not to seek treatment	15 (9.3)
How often do you brush your teeth?	

· A few times a week	2 (1.2)
· Once a day	34 (21.1)
· Twice a day	104 (64.6)
· More than twice a day	21 (13)

What oral hygiene products do you use regularly? (Please tick appropriate answer or answers)

· Fluoride toothpaste	147 (91.9)
· Mouthwash	77 (48.1)
· Dental floss	47 (29.4)
· Sugar free gum	5 (3.1)

Table 5: Oral Health Knowledge: percentage of participant responses by individual survey items

Please indicate if you think the following statements are True or False

Item content	TRUE %	FALSE %
Flossing should be done daily to clean in between teeth.	97.5	2.5
Routine dental visits help keep teeth and gums healthy.	98.1	1.9
Pregnant women should avoid dental treatment unless it's an emergency.	37.3	62.7
Dental decay or cavities can spread from the mother to the baby's mouth.	19.6	80.4
A mother's poor oral hygiene may contribute to low birth weight.	26.7	73.3
The first tooth usually appears at around 6 months of age.	78.3	21.7
Sleeping with a bottle containing formula could cause holes on a baby's teeth.	67.7	32.3
Cavities on baby teeth are OK because they will fall out anyway.	11.2	88.8

Table 6: Plaque and periodontal status

	Frequency (%)
Visible Plaque	
None	6 (3.7)
Mild	64 (39.8)
Moderate	67 (41.6)
Heavy	24 (14.9)
BPE	
0	5 (3.1)
1	11 (6.8)
2	49 (30.4)
3	55 (34.2)
4	41 (25.5)

Table 7: Age versus use of mouthwash

	mouthwash		<i>p</i> -value
	No	Yes	
age 15-25	23	9	0.027
26-35	42	55	
36-45	17	13	
46 and over	1	0	
Total	83	77	

Table 8: Dental hygiene practices versus education achieved

Education	Weekly %	Once daily %	Twice daily %	More than twice daily %	<i>p</i> - value
Primary school	1	2	12	1	
High school	0	19	62	11	
Vocational training	1	0	11	3	
University	0	13	19	6	0.03

Table 9: Age versus smoking

	Smoker		<i>p</i> -value
	Yes	No	
age 15-25	3	28	0.008
26-35	6	90	
36-45	3	27	
46 and over	1	0	
Total	13	145	

Table 10: BPE versus age

	age				<i>p</i> -value
	15-25	26-35	36-45	46 and over	
BPE 0	1	3	1	0	0.030
1	6	5	0	0	
2	8	36	5	0	
3	12	33	10	0	
4	5	21	14	1	
Total	32	98	30	1	

Table 11: BPE versus ethnicity

	Ethnicity						<i>p</i> -value
	Afro-caribbean	Indo-Caribbean	Chinese	Mixed	Caucasian	Other	
BPE 0	1	3	0	1	0	0	0.013
1	5	0	1	4	0	1	
2	15	13	0	20	1	0	
3	21	16	0	18	0	0	
4	14	12	0	15	0	0	
Total	56	44	1	58	1	1	

