Parents and Dentists Attitude Toward The Use of Nitrous Oxide Sedation as a Behavioral Management Technique During Pediatric Dental Care in Kuwait

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Keywords
Nitrous oxide sedation; Dentists attitude; Parents attitude; Pediatric dentistry; Kuwait

Abstract

Objectives: The aim of this study is to assess attitude of parents as well as dentists toward the use of nitrous oxide sedation as a behavioral management technique (BMT) during pediatric dental care in Kuwait. The study will also evaluate if educational programs and training courses in nitrous oxide sedation are required in the country.

Methods: Pre-coded questionnaires were distributed among a random sample of parents and dentists in Kuwait. 376 parents and 201 dentists were included in this cross-sectional study.

Results: Three forth of parents in this study were unaware of nitrous oxide sedation as a BMT; however two third of them accept its usage for their children upon dentist's recommendation. Although Three forth of dentists treating pediatric patients in this study were willing to utilize nitrous oxide sedation, two third of them are not trained. Moreover, this sedation technique is not commonly used in Kuwait due to lack of equipments as stated by most dentists.

Conclusion: The authors recommend providing the following in Kuwait: (1) Educational programs and training courses in nitrous oxide sedation for parents and dentists respectively, and (2) nitrous oxide equipments and facilities in pediatric dental clinics.

Introduction

Managing a child's behavior during dental treatment is an important factor in delivering safe, effective, and pleasant dental care. Various non-pharmacological and pharmacological techniques are recommended by the American Academy of Pediatric Dentistry (AAPD) to enable the dental practitioner to perform quality oral health care on uncooperative pediatric patient, and at the same time alleviate fear and anxiety, guide the child to be cooperative, and nurture a positive dental attitude in him/her\(^1\). Different negative behaviors e.g. fear of the unknown, fear of parental
separation, anxiety, timidity, and resistance, by children during dental visits should be managed differently. In addition to tailoring various behavioral management techniques (BMT) to the individual child, it is also important for dental practitioners to utilize techniques consistent with their level of professional education and clinical experience. When the non-pharmacological approaches, such as age-appropriate communication, tell-show-do, voice control, nonverbal communication, positive reinforcement, distraction, and parental separation, do not work or are not accepted by parents, the pharmacological techniques have to be used.

According to the American Dental Association (ADA), conscious sedation is defined as "a minimally depressed level of consciousness that retains the patient's ability to independently and continuously maintain an airway and respond appropriately to physical stimulation or verbal command and that is produced by a pharmacological or non-pharmacological method or a combination thereof." Of the various pharmacological approaches used, nitrous oxide sedation has a more predictable clinical outcome. It is considered the preferred technique for the pharmacological management of anxiety in pediatric dental patients, and unlike deep sedation or general anesthesia its use is not often limited to hospital settings, provided that the patients are carefully selected. The Council of European Dentists (CED) stated that "The technique in which low concentrations of nitrous oxide gas is titrated with oxygen has been used for years (as early as 1889) in many countries (USA, Great Britain, Australia, and Scandinavia) and is recognized as clinically successful and cost effective compared to General Anaesthesia."

Nitrous oxide sedation is a safe and effective method to alleviate anxiety and enhance effective communication. The anxiolytic effect is produced through causing central nervous system (CNS) depression and euphoria, with minimal effect on respiratory and cardiovascular functions. This gas is colorless, and has a faint sweet odor, which is pleasant for most children to inhale. Furthermore, its action is characterized by a rapid onset and fast recovery; both are ensured by its low tissue solubility. It has a high minimum alveolar concentration (MAC),
thus it is a poor anesthetic at normal atmospheric pressure\textsuperscript{4,7}. In addition to that, its effects are reversible and easily titrated\textsuperscript{3}.

Both the American Academy of Pediatric Dentistry (AAPD) and the European Academy of Paediatric Dentistry (EAPD) recommended a titration technique, which includes the administration of 100% oxygen for one to two minutes, followed by titration of nitrous oxide in 5-10% increments every one minute or so and according to the patient's response until the desired sedation is achieved\textsuperscript{3,7}. The maximum dose of nitrous oxide gas provided by the delivery system should be 70% by volume, which assures minimum oxygen supply of 30\%\textsuperscript{8}. However, the concentration of nitrous oxide inhalation that produces adequate sedation in most cases does not usually exceed 50% by volume\textsuperscript{9}. At this concentration, most medically healthy patients remain awake, calm, and can respond to verbal commands\textsuperscript{10}. Patients undergoing nitrous oxide sedation are not required to fast, though the dentist may allow only light meal consumption in the two hours prior to the sedation appointment\textsuperscript{3,4}.

Nitrous oxide sedation is useful for: (1) Children 4 years and older, (2) Anxious or fearful patients, (3) Those with strong gag reflex that interferes with the dental treatment, (4) Patients with some mental or physical health problems who can communicate but are unable to cooperate, (5) When profound local anesthesia is difficult to obtain, and (6) Cooperative children who need complicated or prolonged dental procedures\textsuperscript{3,7}. On the other hand, it is not suitable for: (1) Pre-cooperative children, (2) Children who can't communicate or can't tolerate the nasal hood, (3) Patients with some chronic obstructive pulmonary diseases, (4) Those with severe emotional disturbances or drug-related dependencies, (5) First trimester of pregnancy, (6) Patients suffering from upper airway problems such as common cold, tonsillitis or nasal blockage, (7) Those with sinusitis or recent ENT operations (within 14 days), (8) Cancer patients receiving bleomycin sulfate therapy, and (9) Methylene tetrahydrofolate reductase deficiency patients \textsuperscript{3,7}. For ASA III
and ASA IV patients who need sedation, it is recommended to deliver nitrous oxide sedation in a hospital setting.

<table>
<thead>
<tr>
<th>American Society of Anesthesiologists (ASA) Patient Physical Status Classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>ASA I</td>
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<tr>
<td>ASA II</td>
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<td>ASA III</td>
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<td>ASA IV</td>
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<td>ASA V</td>
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<td>ASA VI</td>
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When utilizing a dedicated delivery equipment with efficient scavenging system by qualified practitioners on carefully selected patients, an excellent safety record has been associated with the use of nitrous oxide sedation. Additionally, the usage of a fail-safe device, which automatically stops nitrous oxide gas supply once the oxygen pressure drops, increases the safety of this sedation technique. Patients undergoing nitrous oxide sedation rarely complain of adverse effects. The most common noted adverse effects are nausea and vomiting (seen in 0.5% of patients). In addition to that, the combination of nitrous oxide with other sedative agents, that have synergistic CNS depressive effect, can result in over-sedation. Furthermore, the rapid release of nitrous oxide from the blood into the alveoli may result in diffusion hypoxia, which can in turn lead to headache and disorientation. This can be avoided by the administration of 100% oxygen for five minutes following nitrous oxide termination. Moreover, dentists exposed to high concentrations of this gas, particularly when scavenging is inadequate, are more susceptible to nitrous oxide pollution, which has been linked to reduction in vitamin B12 activity. Performing the dental procedures under rubber dam isolation reduces the atmospheric pollution and at the same time improves the effect of the sedation.

Nitrous oxide sedation has been accepted as a popular pharmacological BMT in many Western countries. In 1996, a survey of the AAPD membership revealed that 89% of pediatric dentists utilize nitrous oxide sedation with most of them using it more than 5 times per week. Moreover, this sedation technique is the second most accepted BMT by parents in USA. On the contrary,
several studies showed that majority of parents in the Middle East countries did not accept nitrous oxide sedation as a BMT. One study, which was conducted in 2009, showed that most parents in Kuwait prefer the non-pharmacological techniques over the pharmacological ones, and nitrous oxide sedation was rated as one of the least acceptable techniques\textsuperscript{13}. Similar findings were found by Al-Shalan and Alammouri for Saudi and Jordanian parents respectively\textsuperscript{14,15}.

In 2010 nitrous oxide sedation was officially approved and regulated by the Kuwaiti Dental board. Thus, three years after the approval of the nitrous oxide use by dentists, we decided to further investigate the attitude of parents in Kuwait toward the use of nitrous oxide sedation as a BMT for their children, and assess the necessity for educational programs for the community. In addition to that, we will evaluate the attitude of dentists toward its usage for pediatric dental patients, and if training courses in nitrous oxide sedation are required.

**Subjects and Methods**

This cross-sectional study, which was approved by the Health Sciences Center's ethical committee for students study projects, consists of two questionnaires, which were delivered to parents (Group 1) and dentists (Group 2) in Kuwait. For the purpose of this research, pediatric patients were defined as all patients through 18 years of age.

**Group 1**: 400 pre-coded questionnaires were distributed among a random sample of parents who accompanied their children to the: (1) Kuwait University Dental Center (KUDC), (2) Pediatric dental clinics at 5 specialty dental centers (all specialty dental centers in Kuwait at the time of this study), (3) Pediatric dental clinics at 3 polyclinics (all polyclinics providing pediatric dental care in Kuwait at the time of this study), and (4) Four private clinics advertising for pediatric dental care, which were randomly selected. Parents were randomly recruited from the waiting room of those dental clinics. (1) Parenthood, (2) Literacy, and (3) Minimum age of 21 years were the inclusion criteria for this group in this study.
**Group 2:** 280 pre-coded questionnaires were handed out among a random sample of dentists (general dentists, pediatric dentists, oral and maxillofacial surgeons, periodontists, orthodontists, and endodontists) working in: (1) Kuwait University Dental Center (KUDC), (2) Five specialty dental centers, (3) Five randomly selected polyclinics, one from each residential area as the specialty center, and (4) Five randomly selected private dental clinics advertising for pediatric dental care. The inclusion criteria for this group were: (1) A dentist with a valid dental license, (2) Currently reside and practice in Kuwait, (3) Minimum age of 21 years, and (4) Treat pediatric patients.

Randomization of dental clinics was done using the following website: [www.randomizer.org](http://www.randomizer.org). The list of dental clinics in Kuwait was obtained from the Annual Report of Ministry of Health – Kuwait Dental Administration, 13th edition 2011 (the latest available edition at the time of this study). All parents and dentists who agreed to participate received verbal and written information about the nature and purposes of the study. Upon their approval to participate, an informed consent was obtained from each subject. Participants from both groups were handed self-administered questionnaire, and were instructed to answer all questions, which involved the following independent variables: **Group 1:** (1) Demographic data of the child and the accompanying parent such as age, gender, nationality, government, and child's birth order in the family, (2) Parent's educational and income levels, (3) Reason for the dental visit and child's usual behavior, and (4) Parent's knowledge and attitude toward the use of nitrous oxide as a BMT for their children. **Group 2:** (1) Demographic data such as age, gender, nationality, marital status, (2) Years of dental practice, specialty, and level of training, (3) Training to use nitrous oxide sedation, and (4) Attitude and knowledge toward the use of nitrous oxide sedation as a BMT for pediatric patients.

Data entry, management, analysis, and presentation of results were performed using statistical software, Statistical Package for Social Sciences (SPSS) version 20. A probability value (p-value)
of <0.05 was used as the cut-off level for statistical significance. Frequency, percentage, mean ± standard deviation (SD), and range were used to present descriptive statistics. Person's Chi-square was used to assess the association of different characteristics with parents' or dentists' attitudes.

**Results**

**Group 1:** 381 parents agreed to participate with a response rate of 95.3%; of those, 376 respondents fulfilled the inclusion criteria. The profile of the parents and their child-patient are summarized in tables 1 and 2 respectively. Parents mean age was 35.7 years, ranging between 23 to 65 years. Mothers and fathers accompanied the child-patient in almost equal number (male to female ratio=0.9:1). Half of the parents (50.3%) had university education, followed by high school (29.8%), higher education degrees i.e. master, PhD (12%), and less than high school (8%). The mean age of child-patient was 5.9 years, ranging between 1 to 15 years, with almost equal number of boys and girls (male to female ratio=0.9:1). More than half of the children (68.6%) were seeking dental clinic for restorative treatment. Moreover, Most of them are usually cooperative (52.4%) and fearful (48.8%) during dental treatment as stated by their parents.

![Table 1. Demographics of Parents (N=376)](image1)

<table>
<thead>
<tr>
<th>Demographic</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (years)</td>
<td>35.69 ± 6.42 (23-65)</td>
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</tbody>
</table>

**Table 2. Demographics of Child-Patient (N=376)**

<table>
<thead>
<tr>
<th>Demographic</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (years)</td>
<td>5.88 ± 2.69 (1-15)</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Gender</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>184</td>
<td>49.1</td>
</tr>
<tr>
<td>Female</td>
<td>192</td>
<td>50.9</td>
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<table>
<thead>
<tr>
<th>Reason for today's dental visit</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>First visit</td>
<td>50</td>
</tr>
<tr>
<td>Prevention</td>
<td>41</td>
</tr>
<tr>
<td>Emergency</td>
<td>19</td>
</tr>
<tr>
<td>Orthodontic</td>
<td>9</td>
</tr>
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<table>
<thead>
<tr>
<th>Usual cooperation</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Highly cooperative</td>
<td>72</td>
</tr>
<tr>
<td>Cooperative</td>
<td>196</td>
</tr>
<tr>
<td>Uncooperative</td>
<td>92</td>
</tr>
<tr>
<td>Highly uncooperative</td>
<td>15</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Usual behavior</th>
<th>Frequency</th>
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<tbody>
<tr>
<td>Happy</td>
<td>42</td>
</tr>
<tr>
<td>Fearful</td>
<td>184</td>
</tr>
<tr>
<td>Anxious</td>
<td>117</td>
</tr>
<tr>
<td>Aggressive</td>
<td>28</td>
</tr>
<tr>
<td>Aggressive</td>
<td>5</td>
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</table>
Majority of parents in this study were neither aware of nitrous oxide sedation (79%) (Figure 1), nor its usage as a BMT (75%) (Figure 2). The majority were also unaware of its acceptance as a BMT for dental pediatric patients in Kuwait (86%) (Figure 3).

![Figure 1. Parental Awareness of N₂O sedation](image1)

![Figure 2. Parental Awareness of N₂O sedation Usage as a BMT](image2)

![Figure 3. Parental Awareness of N₂O sedation Acceptance in Kuwait](image3)

However, more than half of parents (66%) in our study would accept nitrous oxide sedation as a BMT for their children if recommended by the treating dentist (Figure 4). In addition to that, a similar percentage of them would prefer this BMT over general anesthesia (GA) if both were suggested by the treating dentist (Figure 5).

![Figure 4. Parental Acceptance of N₂O sedation as a BMT](image4)

![Figure 5. Parental Preference](image5)

Only 19 pediatric patients (5%) had undergone nitrous oxide sedation during previous dental treatments. Table 5 shows that majority of parents are satisfied about their child's experience of this sedation technique. The informed consent was obtained both verbally and written, written only, and verbally only in almost equal frequency.
Table 4 demonstrates association of different characteristics with parents’ acceptance of nitrous oxide sedation. A significant declining trend in parental acceptance was noticed with increasing age of parents (p=0.001). Parental education also showed a significant association with their acceptance of this sedation technique (p=0.031). Moreover, mothers accepted this BMT more compared to fathers (p=0.006, significant), and Kuwaitis more than non-Kuwaitis (p=0.085, insignificant). Furthermore, as income of parents increases, their acceptance of nitrous oxide sedation seems to increase, though this was not significant (p=0.573). It was also found that parents seeking private sectors for dental treatment of their children tend to accept this sedation more than those seeking public sectors; this association was significant (p=0.006). On the other hand, no association was found between parents' acceptance with child-patient's age, gender, birth order, usual cooperation or usual behavior.

<table>
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<th>No N= 126</th>
<th>P – value</th>
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<tr>
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<tr>
<td>20-29</td>
<td>55 (85.9)</td>
<td>9 (14.1)</td>
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<tr>
<td>30-39</td>
<td>127 (66.1)</td>
<td>65 (33.9)</td>
<td></td>
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<tr>
<td>40-49</td>
<td>57 (57.6)</td>
<td>42 (42.4)</td>
<td></td>
</tr>
<tr>
<td>≤ 50</td>
<td>10 (52.6)</td>
<td>9 (47.4)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Male</td>
<td>Female</td>
<td>p-value</td>
</tr>
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<tr>
<td><strong>Parent gender</strong></td>
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<td>106 (59.6)</td>
<td>72 (40.4)</td>
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<td>143 (73.0)</td>
<td>53 (27.0)</td>
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<td>59 (29.5)</td>
<td>0.085</td>
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<tr>
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<td>33 (30.3)</td>
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<td>52 (69.3)</td>
<td>23 (30.7)</td>
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<td>Ahmadi</td>
<td>34 (58.6)</td>
<td>24 (41.4)</td>
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<td>Mubarak Alkabeer</td>
<td>14 (70.0)</td>
<td>6 (30.0)</td>
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<td><strong>Parent education level</strong></td>
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<td>Less than high school</td>
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<td>22 (73.3)</td>
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<td>64 (57.1)</td>
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<td>University graduate</td>
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<td><strong>Parent income level</strong></td>
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<tr>
<td>&lt;500 KD</td>
<td>75 (62.5)</td>
<td>45 (37.5)</td>
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<tr>
<td>500-999 KD</td>
<td>72 (66.1)</td>
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<td>1000-2000 KD</td>
<td>70 (69.3)</td>
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<td>&gt;2000 KD</td>
<td>32 (72.7)</td>
<td>12 (27.3)</td>
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<td>8 (13.8)</td>
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<td>58 (35.2)</td>
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<td>KUDC</td>
<td>41 (61.2)</td>
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<tr>
<td><strong>Child age (years)</strong></td>
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<td>1-3</td>
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<td>23 (37.7)</td>
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<td>4-6</td>
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<td>≤ 7</td>
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<td>39 (31.7)</td>
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<td><strong>Child gender</strong></td>
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<tr>
<td>Male</td>
<td>120 (65.9)</td>
<td>62 (34.1)</td>
<td>0.742</td>
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<tr>
<td>Female</td>
<td>129 (67.5)</td>
<td>62 (32.5)</td>
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<tr>
<td><strong>Birth order</strong></td>
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<tr>
<td>First</td>
<td>94 (69.1)</td>
<td>42 (30.9)</td>
<td>0.579</td>
</tr>
<tr>
<td>Middle</td>
<td>80 (67.2)</td>
<td>39 (32.8)</td>
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<tr>
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<td>75 (63.0)</td>
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<tr>
<td><strong>Reason for today’s dental visit</strong></td>
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<td></td>
<td>0.213</td>
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<tr>
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<td>37 (75.5)</td>
<td>12 (24.5)</td>
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<tr>
<td>Orthodontic</td>
<td>6 (66.7)</td>
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<tr>
<td><strong>Usual cooperation</strong></td>
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<td>Fearful</td>
<td>127 (69.8)</td>
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<td>Apprehensive</td>
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<tr>
<td>Aggressive</td>
<td>3 (60.0)</td>
<td>2 (40.0)</td>
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</tbody>
</table>

Group 2: 238 dentists responded to the questionnaire (response rate =85%); of those, 201 respondents met the inclusion criteria. Table 5 summarizes dentists' demographics. Majority of
dentists in this study were 20 to 29 years old (40.3%) with slightly more male (57.2%) than female dentists (42.8%). Kuwaiti dentists (62.7%) were almost twice the number of non Kuwaitis (37.3%). Furthermore, 38.3% of respondents have been practicing dentistry more than ten years, and 30.3% one to five years. In addition, the majority were general dentists (59.2%) followed by pediatric dentists (13.9%) while the minority were oral and maxillofacial surgeons (5.5%) and periodontists (5%). 60.5% of dentists stated that they treat 1 to 5 pediatric patients per week, with Kuwaiti patients being the majority. Similarly, 49.5% of them treat on average 1 to 5 uncooperative pediatric patients per week.

Table 6 demonstrates dentists' knowledge and attitude towards nitrous oxide sedation as a BMT. More than half of dentists in this study are aware of nitrous oxide sedation acceptance as a

<table>
<thead>
<tr>
<th>Demographic</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Government practiced in</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hawaiili</td>
<td>55</td>
<td>27.8</td>
</tr>
<tr>
<td>Capital</td>
<td>59</td>
<td>29.8</td>
</tr>
<tr>
<td>Jahra</td>
<td>17</td>
<td>8.6</td>
</tr>
<tr>
<td>Farwania</td>
<td>26</td>
<td>13.1</td>
</tr>
<tr>
<td>Ahmadi/Mubarak</td>
<td>41</td>
<td>20.7</td>
</tr>
<tr>
<td>AlKabeer</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Number of pediatric patients treated per week</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1-5</td>
<td>121</td>
<td>60.5</td>
</tr>
<tr>
<td>6-10</td>
<td>20</td>
<td>10</td>
</tr>
<tr>
<td>&gt;10</td>
<td>59</td>
<td>29.5</td>
</tr>
<tr>
<td><strong>Nationality of the pediatric patients treated</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mostly Kuwaitis</td>
<td>90</td>
<td>44.8</td>
</tr>
<tr>
<td>Mostly non-Kuwaitis</td>
<td>58</td>
<td>28.9</td>
</tr>
<tr>
<td>Kuwaitis</td>
<td>53</td>
<td>26.4</td>
</tr>
<tr>
<td>Almost equal number</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Number of uncooperative pediatric patients treated per week (Average)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>none</td>
<td>60</td>
<td>30</td>
</tr>
<tr>
<td>1-5</td>
<td>99</td>
<td>49.5</td>
</tr>
<tr>
<td>6-10</td>
<td>25</td>
<td>12.5</td>
</tr>
<tr>
<td>&gt;10</td>
<td>16</td>
<td>8</td>
</tr>
</tbody>
</table>
BMT in Kuwait. Despite the fact that 94% of dentists did not use nitrous oxide sedation as a BMT for their pediatric patients, 74.5% are willing to use it. However, dentists who are not trained (64.2%) to utilize nitrous oxide sedation are double the number of trained ones (35.8%). Figure 6 demonstrates types of training respondents received. Although only 23.9% of dentists are aware of regulations about nitrous oxide sedation usage for pediatric patients in Kuwait, over half (55.2%) are aware of regulations about its usage internationally. 90.9% of dentists believe that nitrous oxide sedation is ethical for pediatric patients but 67.7% think it is safe and almost equal number of dentists agree or are not sure about its cost effectiveness (44%, 49.5% respectively). Furthermore, the majority of them (34.2%) believe that patients 6 years old and above are safely treated under nitrous oxide sedation. In addition, when dentists were asked about the main reasons of the lack of utilization of nitrous oxide sedation in Kuwait, majority (44.6%) answered: lack of facilities/equipments and lack of training/knowledge. Moreover, majority of dentists in this study (73.1%) think that parents are not aware of nitrous oxide sedation as a BMT for their children.

![Figure 6. Types of N₂O training](image)

<p>| Table 6. Dentists knowledge and Attitude Towards N₂O Sedation as a BMT (N=201) |
|---------------------------------|-----------------|-------------|
| Parameter                        | Frequency | Percent   |
| Do you use N₂O as a BMT         |           |            |
| Yes                             | 12        | 6          |
| No                              | 189       | 94         |
| Are you willing to use N₂O      |           |            |
| Yes                             | 149       | 74.5       |
| No                              | 51        | 25.5       |
| Did you get training on N₂O     |           |            |
| Yes                             | 72        | 35.8       |
| No                              | 129       | 64.2       |</p>
<table>
<thead>
<tr>
<th>Question</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Do you know that the use of N₂O Sedation as a BMT for pediatric patients has been accepted in Kuwait</td>
<td>128</td>
<td>73</td>
</tr>
<tr>
<td>Are you aware of any guidelines/regulations for the use of N₂O Sedation for pediatric patients in Kuwait</td>
<td>48</td>
<td>153</td>
</tr>
<tr>
<td>Are you aware of any guidelines/regulations for the use of N₂O Sedation for pediatric patients internationally</td>
<td>111</td>
<td>90</td>
</tr>
<tr>
<td>Do you think that the use of N₂O Sedation as a BMT for pediatric patients is ethical</td>
<td>180</td>
<td>18</td>
</tr>
<tr>
<td>N₂O Sedation as a BMT during pediatric dental care is safe</td>
<td>136</td>
<td>39</td>
</tr>
<tr>
<td>N₂O Sedation as a BMT during pediatric dental care is cost effective</td>
<td>88</td>
<td>99</td>
</tr>
<tr>
<td>What age group do you believe can be treated safely under N₂O Sedation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(a) 1-5 yrs</td>
<td>22</td>
<td>11.2</td>
</tr>
<tr>
<td>(b) 6-10 yrs</td>
<td>21</td>
<td>10.7</td>
</tr>
<tr>
<td>(c) &gt;10 yrs</td>
<td>17</td>
<td>8.7</td>
</tr>
<tr>
<td>(a) &amp; (b)</td>
<td>29</td>
<td>14.8</td>
</tr>
<tr>
<td>(b) &amp; (c)</td>
<td>67</td>
<td>34.2</td>
</tr>
<tr>
<td>All</td>
<td>39</td>
<td>19.9</td>
</tr>
<tr>
<td>None</td>
<td>1</td>
<td>0.5</td>
</tr>
<tr>
<td>Why do you think that N₂O Sedation as a BMT during pediatric dental care is not commonly used in Kuwait</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lack of facilities/equipments</td>
<td>16</td>
<td>8.2</td>
</tr>
<tr>
<td>Serious side effects of N₂O sedation</td>
<td>4</td>
<td>2.1</td>
</tr>
<tr>
<td>Lack of training /knowledge of dentists</td>
<td>27</td>
<td>13.8</td>
</tr>
<tr>
<td>Parents disagreement</td>
<td>6</td>
<td>3.1</td>
</tr>
<tr>
<td>Child’s refusal</td>
<td>1</td>
<td>0.5</td>
</tr>
<tr>
<td>It is illegal</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Staff safety</td>
<td>12</td>
<td>6.2</td>
</tr>
<tr>
<td>Lack of facilities/equipments and lack of training/knowledge</td>
<td>87</td>
<td>44.6</td>
</tr>
<tr>
<td>Lack of facilities/equipments and lack of training/knowledge of dentists and parents disagreement</td>
<td>29</td>
<td>14.9</td>
</tr>
<tr>
<td>Lack of facilities/equipments and lack of training/knowledge of dentists and parents disagreement and staff safety</td>
<td>11</td>
<td>5.6</td>
</tr>
<tr>
<td>Do you think that parents are aware of N₂O Sedation as a BMT for their children</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>52</td>
<td>26.9</td>
</tr>
<tr>
<td>No</td>
<td>141</td>
<td>73.1</td>
</tr>
</tbody>
</table>
When cross tabulation was done (Table 7), female dentists seemed to be significantly more willing to use nitrous oxide sedation than males (p-value = 0.001). On the contrary, there was no significant difference with regards to dentists’ age, nationality, years of dental practice and main practice setting. Pediatric dentists and periodontists are more willing to utilize nitrous oxide sedation while orthodontists are not willing to use it (p-value = 0.000).

Furthermore, dentists who work in Hawalli tend to be more willing to use nitrous oxide sedation than in other governments (p-value = 0.059). Although there was no difference whether the patients were Kuwaitis or not neither the number of patient being treated, there is a proportional relationship between the number of uncooperative patients and willingness of the dentists to use nitrous oxide sedation (p-value= 0.000). In addition, it is evident that dentists who are trained to use nitrous oxide sedation are more willing to utilize it (p-value = 0.000).

<p>| Table 7. The Characteristics of Dentists and their willingness to use N2O as a BMT |</p>
<table>
<thead>
<tr>
<th>Parameter</th>
<th>Willingness of dentists</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Yes</td>
<td>N=149</td>
</tr>
<tr>
<td>Age</td>
<td></td>
<td></td>
</tr>
<tr>
<td>20-29 yrs</td>
<td>64</td>
<td>(79)</td>
</tr>
<tr>
<td>30-39 yrs</td>
<td>48</td>
<td>(77.4)</td>
</tr>
<tr>
<td>40-49 yrs</td>
<td>20</td>
<td>(62.5)</td>
</tr>
<tr>
<td>≥50 yrs</td>
<td>17</td>
<td>(68)</td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>75</td>
<td>(65.8)</td>
</tr>
<tr>
<td>Female</td>
<td>74</td>
<td>(86)</td>
</tr>
<tr>
<td>Nationality</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kuwaiti</td>
<td>97</td>
<td>(77)</td>
</tr>
<tr>
<td>Non Kuwaiti</td>
<td>52</td>
<td>(70.3)</td>
</tr>
<tr>
<td>Years practiced</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;1</td>
<td>18</td>
<td>(72)</td>
</tr>
<tr>
<td>1-5</td>
<td>51</td>
<td>(83.6)</td>
</tr>
<tr>
<td>6-10</td>
<td>29</td>
<td>(76.3)</td>
</tr>
<tr>
<td>&gt;10</td>
<td>51</td>
<td>(67.1)</td>
</tr>
<tr>
<td>Specialty</td>
<td></td>
<td></td>
</tr>
<tr>
<td>GP</td>
<td>94</td>
<td>(79)</td>
</tr>
<tr>
<td>Pediatric dentistry</td>
<td>25</td>
<td>(89.3)</td>
</tr>
<tr>
<td>OMFS</td>
<td>7</td>
<td>(70)</td>
</tr>
<tr>
<td>Periodontology</td>
<td>9</td>
<td>(90)</td>
</tr>
<tr>
<td>Orthodontics</td>
<td>0</td>
<td>(0)</td>
</tr>
<tr>
<td>Endodontics</td>
<td>14</td>
<td>(73.7)</td>
</tr>
<tr>
<td>Level of training</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Trainee</td>
<td>31</td>
<td>(77.5)</td>
</tr>
<tr>
<td>Assistant registrar</td>
<td>35</td>
<td>(87.5)</td>
</tr>
<tr>
<td>Registrar</td>
<td>25</td>
<td>(62.5)</td>
</tr>
<tr>
<td>Senior registrar</td>
<td>24</td>
<td>(63.2)</td>
</tr>
<tr>
<td>Specialist</td>
<td>20</td>
<td>(74)</td>
</tr>
<tr>
<td>Consultant</td>
<td>11</td>
<td>(100)</td>
</tr>
<tr>
<td>Main practice setting</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Private clinic</td>
<td>6</td>
<td>(85.7)</td>
</tr>
<tr>
<td>Governmental polyclinic</td>
<td>81</td>
<td>(77.1)</td>
</tr>
<tr>
<td>Governmental specialty center</td>
<td>48</td>
<td>(65.8)</td>
</tr>
<tr>
<td>Educational institute (KUDC)</td>
<td>13</td>
<td>(92.9)</td>
</tr>
<tr>
<td>Government practiced in</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hawalli</td>
<td>45</td>
<td>(83.3)</td>
</tr>
<tr>
<td>Capital</td>
<td>44</td>
<td>(74.6)</td>
</tr>
<tr>
<td>Jahra</td>
<td>10</td>
<td>(58.8)</td>
</tr>
<tr>
<td>Farwania</td>
<td>15</td>
<td>(57.7)</td>
</tr>
<tr>
<td>Ahmadi/Mubarak AlKabeer</td>
<td>33</td>
<td>(80.5)</td>
</tr>
<tr>
<td>Number of pediatric patients</td>
<td></td>
<td></td>
</tr>
<tr>
<td>treated per week</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1-5</td>
<td>94</td>
<td>(78.3)</td>
</tr>
<tr>
<td>6-10</td>
<td>13</td>
<td>(65)</td>
</tr>
<tr>
<td>&gt;10</td>
<td>42</td>
<td>(71.2)</td>
</tr>
<tr>
<td>Nationality of the pediatric</td>
<td></td>
<td></td>
</tr>
<tr>
<td>patients treated</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mostly Kuwaitis</td>
<td>61</td>
<td>(67.8)</td>
</tr>
<tr>
<td>mostly non-Kuwaitis</td>
<td>46</td>
<td>(79.3)</td>
</tr>
<tr>
<td>Almost equal number</td>
<td>42</td>
<td>(80.8)</td>
</tr>
<tr>
<td>Number of uncooperative pediatric</td>
<td></td>
<td></td>
</tr>
<tr>
<td>patients treated per week (Average)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>none</td>
<td>34</td>
<td>(56.7)</td>
</tr>
<tr>
<td>1-5</td>
<td>77</td>
<td>(78.6)</td>
</tr>
<tr>
<td>6-10</td>
<td>23</td>
<td>(92)</td>
</tr>
<tr>
<td>&gt;10</td>
<td>15</td>
<td>(93.8)</td>
</tr>
<tr>
<td>Did you get training on N2O</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>65</td>
<td>(91.5)</td>
</tr>
<tr>
<td>No</td>
<td>84</td>
<td>(65.1)</td>
</tr>
</tbody>
</table>
Discussion

This study showed that majority of parents in Kuwait are unaware of nitrous oxide sedation as a BMT or its acceptance in the country. Yet, when this BMT is recommended by the treating dentist, more than half of parents accept its usage for their children. Parents' age and education were the main factors associated with their acceptance. Almost all parents in our study who reported that their child had nitrous oxide sedation before were pleased with their child experience. Therefore, it is the role of the dentist treating pediatric patients to explain this sedation as a BMT and offer it to parents whenever it is suitable and indicated. This study also demonstrated that the acceptance of parents to nitrous oxide sedation is higher compared to previous studies conducted in the Middle East countries including Kuwait. This might be due to differences in the method by which these studies were conducted and the sample size used in each study.

Although nitrous oxide sedation has become a routine BMT for pediatric patients in contemporary American dental practice, only 12 out of 201 dentists (6%) in Kuwait are using it. It was shown by this study that this BMT is not commonly used in Kuwait due to two main reasons, which are the shortage of facilities/equipments in addition to lack of dentist training/knowledge. Concerning nitrous oxide sedation safety, majority of dentists agreed on its safety which is consistence with most studies. Similar results were shown when they were questioned about its ethical consideration but with higher agreement. Furthermore, most dentists either agree or are not sure about its cost effectiveness. An article by Hulland et al. 2002 revealed that on the basis of a 10-years retrospective study, the utilization of nitrous oxide-oxygen sedation as a single agent provides effective and safe conscious sedation for pediatric patients; possible reasons of its effectiveness are that nitrous oxide sedation calms agitated pediatric patient, suppresses their anxiety, and decreases unpleasant dental care memories. In addition, the dentist can work quicker and in a more focused manner, diminishing the chance of mechanical
error and improving the quality of dental care; consequently, fewer dental appointments and less missed school days for the child \(^7\).

**Limitations of this study:** The sample size of this study was obtained from four main dental settings in Kuwait, which are KUDC (educational institute), polyclinics, specialty centers and private clinics. The authors of this study were not given the permission to distribute the study questionnaires in School Oral Health program (SOHP) centers. The sample of the study would be more representative of the population in Kuwait if SOHP was included as a 5\(^{th}\) dental setting since not only a great number of dentists who treat pediatric patients work in SOHP centers, but also a good proportion of parents in Kuwait seek those centers for their child's dental needs.

**Conclusion**

It was demonstrated by this study that:

1. Most parents in Kuwait are unaware of nitrous oxide sedation as a BMT, but more than half of them accept its usage for their children upon dentist's advice and recommendation.
2. Vast majority of dentists treating pediatric patients in Kuwait are willing to use nitrous oxide sedation as a BMT, but more than half of them are not trained.
3. Lack of nitrous oxide equipments and facilities is another main reason for not using this sedation technique by dentists in Kuwait.

Thus, we can conclude that the following needs to be provided in the country:

1. Educational programs about the usage of nitrous oxide sedation as a BMT for parents and the community.
2. Training courses in nitrous oxide sedation for dentists treating pediatric patients.
Acknowledgment

We would like to express our deepest appreciation to all the parents and dentists, whose participation was essential for the completion of this study. We would also like to acknowledge the Assistant Undersecretary for Dental Affairs (MoH), Dr. Yousef Alduwairi, as well as the clinical director of KUDC (academic year 2012/2013), Dr. Faisal Amir, who gave us the permission to hand out our questionnaires in dental clinics at specialty centers and polyclinics, and KUDC respectively. Moreover, many thanks go to Dr. Abdulaziz Hassan, Dr. Yousif Shehab, and Dr. Mohammad Alkazemi for their kind approval to distribute our questionnaires in their clinics. Last but not the least, a special gratitude we give to Dr. Eino Honkala, Dr. Muawia Qudeimat, Dr. Qoot Alkhubaizi, Dr. Hassan Khaja, Dr. Moubarak Othman, Dr. Ahmed Altimimi, Dr. Sattar Khan, and Ms. Anisha Varghese for their great help and support during this study.
References


8. The conclusion of the committee formed by resolution no. 1260 for the year 2010. Ministry of Health, dental administration department, Kuwait.


Appendices
Title of the Project: Dentists and parents attitude towards the use of nitrous oxide sedation as a behavioral management technique during pediatric dental care in Kuwait.

Aim of this research is:
Nitrous oxide sedation became accepted to be used in pediatric dental practice in Kuwait since 2010. Thus, the aim of this study is to assess attitude of dentists as well as parents toward the use of nitrous oxide sedation as a behavioral management technique in Kuwaiti dental care. The study will also evaluate if training courses in nitrous oxide sedation are required for dentists in the country. In addition to that, it will assess the necessity for further educational programs for the community.

The procedures involved in this study include:
In the study there will be no medical or dental procedures provided to participants. Participants must only answer 33 questions on this questionnaire, which should only take you about 5 minutes to be completed. There are no risks to you if you participate in this research. Your participation will increase knowledge about this important issue. All information collected will remain confidential. Neither your name or your address will be recorded in any assessment. There is no obligation or compulsion for you to participate, and you have the freedom to agree or not agree to participate this will not have any effect on your right to receive the health care. You may quit from the research on any time.

Please indicate (✓) below if you wish to participate or decline to do so:

☐ I wish to participate   Signature of participant:………………
☐ I do not wish to participate

Thank You for Your Cooperation...

Students name: Sarah A. Al-Kandari & Fatemah A. Al-Mousa
Faculty of Dentistry

Supervised by: Dr. Mohammad Abdulwahab

Date:----------------
جامعة الكويت
كلية طب الأسنان
قسم العلوم الجراحية
2013

إقرار مستنير للبالغين (كامل الاهلية) بالموافقة

عنوان الدراسة: موقف أطباء الأسنان وأولياء الأمور نحو استخدام الغاز المهدئ (غاز أوكسيد النيتروز) كوسيلة لإدارة سلوك الأطفال خلال العناية بالأطفال في الكويت

الهدف من إجراء هذه الدراسة هو:

لقد أصبح استخدام الغاز المهدئ (غاز أوكسيد النيتروز) أثناء معالجة أسنان الأطفال مسموحاً به في دولة الكويت منذ 2002. فالهدف من هذه الدراسة هو تقييم موقف أطباء الأسنان وأولياء الأمور نحو استخدام الغاز المهدئ (غاز أوكسيد النيتروز) كوسيلة لإدارة سلوك الأطفال خلال العناية بأبنائهم. كما تهدف إلى تحديد مدى حاجة أطباء إلى الدورات التدريبية في كيفية استخدام الغاز المهدئ (غاز أوكسيد النيتروز) في دولة الكويت. بالإضافة إلى ذلك فإن هذه الدراسة ستقيم مدى حاجة مجتمعاً للبرامج التوعوية عن استخدام هذه الوسيلة في طب الأسنان.

الإجراءات المتبعة في هذه الدراسة تتضمن التالي:

لا تحتوي هذه الدراسة على أي تدخل طبي أو سني للمشاركين فيها، كما لا يتوجب على المشاركين في هذه الدراسة إلا الإجابة على 33 سؤال من خلال هذا الاستبيان المكتوب والذي يستغرق 5 دقائق تقريباً. جميع المعلومات التي سيستلمها الباحث مضمونية. لا يجوز كstral أسماء المشاركين في هذه الدراسة. يتضمن الهدف من هذه الدراسة إجراء البيانات وإعداد نتائج الدراسة. لا يوجد أي تدخل حيوي من السياق الطبي أو الأخلاقي في هذه الدراسة. كلاً من المشاركين والباحثين يتعهدان باتخاذ التدابير اللازمة لضمان خصوصية المعلومات التي يتم جمعها. Participating in this study is voluntary.

المشاركة في هذه الدراسة اختيارية و غير ملزمة. لا يتحمل الباحث أي مسؤولية عن الأضرار التي قد تسببها المشاركة في هذه الدراسة. إذ سيتولى الباحث الاستجابة الكاملة للإجابة الطبية المقررة لك. ولك الحق في التحفظ على الإجابة أو الانسحاب من الدراسة في أي وقت. الرجاء وضع علامة (✓) في المكان المناسب:

توقيع المشارك بالبحث: ............................................................

أرغب بالمشاركة □ لا أرغب بالمشاركة □

نتيجة لكمس حسن تعاونكم.

اسم الطالبة: سارة الكندري & فاطمة الموسى

كلية: كلية طب الأسنان

اسم المشرف على الدراسة: د. محمد عبدالوهاب

التاريخ:..........................
Dentists and Parents Attitude Towards The Use of Nitrous Oxide Sedation as a Behavioural Management Technique During Pediatric Dental Care in Kuwait.

Parents Questionnaire:

1. Age of the parent: .................................................................

2. Gender of the parent:
   a. Male
   b. Female

3. Nationality:
   a. Kuwaiti
   b. Non-Kuwaiti

4. In which governance do you live?
   a. Hawalli
   b. Capital “Assema”
   c. Jahra
   d. Farwania
   e. Ahmadi
   f. Mubarak Alkabeer

5. Education level of the parent:
   a. Less than high school
   b. High school graduate
   c. College or university graduate
   d. Higher educational degrees (Master, PhD)

6. Occupation of the parent: ...................................................................................................

7. Income level of the parent: ...................................................................................................
   a. <500 KD
   b. 500-999 KD
   c. 1000-2000 KD
   d. >2000 KD

8. Gender of the child seeking dental treatment today:
   a. Male
   b. Female

9. Age of the child: .................................................................................................

10. Number of siblings: ..............................................................................................

11. Order of the child among siblings: .................................................................

12. Does the child live with both parents?
   a. Yes
   b. No
13. Reason for today's dental visit:
   a. First visit
   b. Prevention
   c. Restorative
   d. Emergency
   e. Orthodontic treatment

14. Do you accompany your child for his/her dental visits:
   a. Rarely
   b. Sometimes
   c. Often
   d. Always

15. Do you prefer to be with your child in the dental room during treatment?
   a. Yes
   b. No

16. How does your child usually behave during dental treatment:
   a. Highly cooperative
   b. Cooperative
   c. Uncooperative
   d. Highly Uncooperative

17. Your child usually is ............... during dental treatment:
   a. Happy
   b. Fearful
   c. Anxious
   d. Apprehensive
   e. Aggressive

18. Do you know what is nitrous oxide sedation:
   a. Yes
   b. Not sure
   c. No

19. Do you know that nitrous oxide sedation can be used as a behavioural management technique, when needed, in dental practice:
   a. Yes
   b. Not sure
   c. No

20. Do you know that the use of Nitrous Oxide Sedation as a behavioural management technique for children has been accepted in Kuwait?
   a. Yes
   b. Not sure
   c. No
21. I think the use of nitrous oxide sedation as a behavioural management technique during dental treatment is **useful**:  
   a. Agree  
   b. Neutral  
   c. Disagree  

   • Why (the reason for your answer)?
     ..............................................................................................................................................................
     ..............................................................................................................................................................
     ..............................................................................................................................................................

22. I think the use of nitrous oxide sedation as a behavioural management technique during dental treatment is **safe**:  
   a. Agree  
   b. Neutral  
   c. Disagree  

   • Why (the reason for your answer)?
     ..............................................................................................................................................................
     ..............................................................................................................................................................
     ..............................................................................................................................................................

23. Do you agree to use nitrous oxide sedation as a behavioural management technique for your child, if needed, during dental treatment?  
   a. Yes  
   b. No  

   • If no, specify the reason
     ..............................................................................................................................................................
     ..............................................................................................................................................................
     ..............................................................................................................................................................

24. Do you think that nitrous oxide sedation has negative effects?  
   a. Agree  
   b. Neutral  
   c. Disagree  

   • Why (the reason for your answer)?
     ..............................................................................................................................................................
     ..............................................................................................................................................................
     ..............................................................................................................................................................

25. Do you think that nitrous oxide sedation is dangerous and can lead to death?  
   a. Agree  
   b. Neutral  
   c. Disagree

26. Do you think that dentistry in the hospital using a general anaesthesia in the operating room is a better alternative?  
   a. Yes  
   b. No
27. Did you (yourself) ever use nitrous oxide sedation during dental treatment before:
   a. Yes
   b. No
   c. Can't remember

28. Did your child ever have nitrous oxide sedation during dental treatment before:
   a. Yes
   b. No

   • If no, end of the questionnaire. Thank you for your participation😊
   • If yes, please continue answering the rest of the questionnaire.

29. The use of nitrous oxide sedation was successful for my child in that dental visit:
   a. Agree
   b. Neutral
   c. Disagree

30. The use of nitrous oxide sedation, in that visit, was very helpful and necessary to do the dentistry:
   a. Agree
   b. Neutral
   c. Disagree

31. The use of nitrous oxide sedation made my child more comfortable during that visit:
   a. Agree
   b. Neutral
   c. Disagree

32. The use of nitrous oxide sedation, in that visit, had a negative effect on my child later:
   a. Agree
   b. Neutral
   c. Disagree
   • If "agree", how?

   ..............................................................................................................................
   ..............................................................................................................................
   ..............................................................................................................................

33. How was the informed consent taken?
   a. No consent was taken
   b. Verbally
   c. Written
   d. Both verbally and written

Thank you for your participation😊
موقف أطباء الأسنان و أولياء الأمور نحو استخدام الغاز المهدئ (غاز أوكسيد النيتروز) كوسيلة لإدارة سلوك الأطفال خلال العناية بالأسنان في الكويت

استبيان أولياء الأمور:

1. عمر ولي الأمر: ............................................................

2. جنس ولي الأمر:
   a. ذكر
   b. أنثى

3. جنسية ولي الأمر:
   a. كويتي
   b. غير كويتي

4. في أي محافظة تسكن؟
   a. حولي
   b. العاصمة
   c. الجهراء
   d. الفروانية
   e. الأحمدي
   f. مبارك الكبير

5. مستوى تعليم ولي الأمر:
   a. أقل من الثانوية العامة
   b. الثانوية العامة
   c. خريج كلية أو جامعة
   d. دراسات عليا (شهادة ماجستير، شهادة دكتوراه)

6. وظيفة ولي الأمر: ............................................................

7. مستوى دخل ولي الأمر:
   a. >500 دينار كويتي
   b. 999-500 دينار كويتي
   c. 1000-2000 دينار كويتي
   d. <2000 دينار كويتي

8. ما هو جنس طفلك القادم للعلاج في عيادة الأسنان اليوم؟
   a. ذكر
   b. أنثى

9. ما هو عمر طفلك؟ ............................................................

10. كم شقيق (أخ و أخت) لدى طفلك؟..............................................
11. ما هو ترتيب طفلك بين أشقاءه (أخوته وأخواته)؟

12. هل يعيش الطفل مع كلا الوالدين؟
   a. نعم
   b. لا

13. ما هو سبب زيارة طفلك لعيادة الأسنان اليوم؟
   a. أول زيارة
   b. وقاية
   c. علاج
   d. طوارئ
   e. تقويم

14. هل تراقب بانتظام طفلك لعيادة الأسنان؟
   a. نادراً
   b. أحياناً
   c. كثيراً
   d. دائماً

15. هل تفضل أن تكون مع طفلك في عيادة الأسنان أثناء العلاج؟
   a. نعم
   b. لا

16. كيف يصرف طفلك عادة أثناء علاج الأسنان؟
   a. متعاون جداً
   b. متعاون
   c. غير متعاون
   d. غير متعاون أطلاقاً

17. عادة ما يكون طفلك................. أثناء علاج الأسنان:
   a. سعيد
   b. خائف
   c. فقٌ
   d. خجول
   e. عدواني

18. هل تعلم ما هو الغاز المهدئ (غاز أكسيد النيتروز)؟
   a. نعم
   b. غير متأكد
   c. لا

19. هل تعلم أن يمكن استخدام الغاز المهدئ (غاز أكسيد النيتروز) كأداة لإدارة سلوك الأطفال خلال العناية بالأسنان عند الحاجة؟
   a. نعم
   b. غير متأكد
   c. لا
20. هل تعلم أن استخدام الغاز المهدئ (غاز أكسيد النتروز) كاذأ لإدارة سلوك الأطفال خلال العناية بالأسنان مسموحاً في الكويت؟
   a. نعم
   b. غير متأكد
   c. لا

21. أعتقد أن استخدام الغاز المهدئ (غاز أكسيد النتروز) كاذأ لإدارة سلوك الأطفال خلال العناية بالأسنان:
   a. أوافق
   b. محايد
   c. لا أوافق
لماذا؟ (سبب اختيارك لهذه الإجابة)

22. أعتقد أن استخدام الغاز المهدئ (غاز أكسيد النتروز) كاذأ لإدارة سلوك الأطفال خلال العناية بالأسنان:
   a. أوافق
   b. محايد
   c. لا أوافق
لماذا؟ (سبب اختيارك لهذه الإجابة)

23. هل توافق على استخدام الغاز المهدئ (غاز أكسيد النتروز) كاذأ لإدارة سلوك الأطفال خلال العناية بالأسنان؟
   a. نعم
   b. لا
   إذا أجبت ب "لا"، ذكر الأسباب:

24. هل تعتقد أن الغاز المهدئ (غاز أكسيد النتروز) له آثار سلبية؟
   a. أوافق
   b. محايد
   c. لا أوافق
لماذا؟ (سبب اختيارك لهذه الإجابة)

25. هل تعتقد أن الغاز المهدئ (غاز أكسيد النتروز) خطير وقد يتسبب بالوفاة؟
   a. أوافق
   b. محايد
   c. لا أوافق
26. هل تعتقد أن طلب الأسنان في المستشفى باستخدام التخدير العام في غرفة العمليات يعتبر بديل أفضل؟

   a. نعم
   b. لا

27. هل استخدمت (أنت) من قبل الغاز المهدئ (غاز أكسيد النيتروز) أثناء تلقيك للعلاج في عيادة الأسنان؟

   a. نعم
   b. لا
   c. لا أتذكر

28. هل استخدم طفلك من قبل الغاز المهدئ (غاز أكسيد النيتروز) أثناء تلقيه للعلاج في عيادة الأسنان؟

   a. نعم
   b. لا

   إذا أجبت ب "لا", انتهى الاستبيان. نشكر لكم حسن مشاركتكم في هذا الاستبيان.

29. لقد كان استخدام طفلي للغاز المهدئ (غاز أكسيد النيتروز) في تلك الزيارة ناجحاً:

   a. أوافق
   b. محايد
   c. لا أوافق

30. لقد كان استخدام الغاز المهدئ (غاز أكسيد النيتروز) في تلك الزيارة مفيداً وضرورياً:

   a. أوافق
   b. محايد
   c. لا أوافق

31. استخدام الغاز المهدئ (غاز أكسيد النيتروز) جعل طفلي أكثر راحة خلال تلك الزيارة:

   a. أوافق
   b. محايد
   c. لا أوافق

32. لقد كان استخدام الغاز المهدئ (غاز أكسيد النيتروز) في تلك الزيارة أثار سلبية على طفلي لأحقاً:

   a. أوافق
   b. محايد
   c. لا أوافق

   إذا أجبت ب "أوافق", اذكر الأسباب:

33. كيف تم أخذ الموافقة المسبقة في تلك الزيارة؟

   a. لم يتم أخذ الموافقة المسبقة
   b. شفهيا
   c. مكتوبًا
   d. شفهياً ومكتوبًا

نشكر لكم حسن مشاركتكم في هذا الاستبيان.
Dentists and Parents Attitude Towards The Use of Nitrous Oxide Sedation as a Behavioural Management Technique During Pediatric Dental Care in Kuwait.

**Dentists Questionnaire**

**Demographic data:**

1. Age:
   a. 20-29 yrs
   b. 30-39 yrs
   c. 40-49 yrs
   d. ≥ 50 yrs

2. Gender:
   a. Male
   b. Female

3. Nationality:
   a. Kuwaiti
   b. Non-Kuwaiti

4. Marital status:
   a. Single
   b. Married

5. Do you have children
   a. Yes
   b. No

6. Years of dental practice **in Kuwait**: ..........................

7. Years of dental practice **outside Kuwait**: ..........................

8. What is your speciality:
   a. General dentistry
   b. Pediatric dentistry
   c. Oral and maxillofacial surgery
   d. Periodontology
   e. Orthodontics
   f. Endodontics
   g. Other specialization ..........................
9. What is your level of training?
   a. Trainee
   b. Assistant registrar
   c. Registrar
   d. Senior registrar
   e. Specialist
   f. Consultant
   g. Other ……………………………

10. What is your main practice setting?
   a. Private clinic
   b. Governmental polyclinic
   c. Governmental specialty center
   d. Governmental hospital
   e. Educational institute (KUDC)
   f. Other …………………………….

11. In which governance do you practice?
   a. Hawalli / Kuwait university
   b. Capital “Assema”
   c. Jahra
   d. Farwania
   e. Ahmadi/ Mubarak Alkabeer

**Dental practice and attitude**
12. Do you treat pediatric patients (**0-18 years old**, as defined in this study):
   a. Yes
   b. No
      • If No, it is the end of the questionnaire, thank you for your participation 😊

13. I feel comfortable treating pediatric patients
   a. Agree
   b. Neutral
   c. Disagree

14. How many pediatric patients do you treat per week?
   a. 1-5
   b. 6-10
   c. > 10

15. What is the nationality of the pediatric patients you have treated?
   a. Mostly Kuwaitis
   b. Mostly non-Kuwaiti
   c. Almost equal number
16. How old are the pediatric patients that you have treated (you can choose more than one answer)?
   a. 1-3 yrs  
   b. 4-6 yrs  
   c. 7-9 yrs  
   d. 10-12 yrs  
   e. 13-15 yrs  
   f. 16-18 yrs  

17. On average, how many uncooperative pediatric patients do you treat per week?
   a. None  
   b. 1-5  
   c. 6-10  
   d. > 10  

18. Which behavioural management technique do you usually use for your pediatric patients? (you can choose more than one answer):
   a. Tell-show-do technique  
   b. Positive reinforcement  
   c. Nonverbal communication  
   d. Distraction  
   e. Modelling  
   f. Voice control  
   g. Parental separation  
   h. Hand over mouth technique  
   i. Protective stabilization  
   j. Hypnosis  
   k. Nitrous Oxide Sedation  
   l. Other conscious sedation techniques  
   m. General anesthesia
19. Do you **use** Nitrous Oxide Sedation as a behavioural management technique for pediatric patients in your practice?
   a. Yes
   b. No (go to question #21)
      - If Yes, specify in which situations
        ........................................................................................................................................................................
        ........................................................................................................................................................................
        ........................................................................................................................................................................

20. How often do you use Nitrous Oxide Sedation as a behavioural management technique for pediatric patients in your practice?
   a. rarely
   b. Sometimes
   c. Often
   d. always

21. Are you **willing** to use Nitrous Oxide Sedation as a behavioural management technique for pediatric patients in your practice?
   a. Yes
   b. No
      - If No, specify the reason
        ........................................................................................................................................................................
        ........................................................................................................................................................................
        ........................................................................................................................................................................

22. Did you get training on Nitrous Oxide Sedation?
   a. Yes (specify ................................................)
   b. No

23. Do you know that the use of Nitrous Oxide Sedation as a behavioural management technique for pediatric patients has been accepted **in Kuwait**?
   a. Yes
   b. No

24. Are you aware of any guidelines/regulations for the use of Nitrous Oxide Sedation for pediatric patients in **Kuwait**?
   a. Yes
   b. No

25. Are you aware of any guidelines/regulations for the use of Nitrous Oxide Sedation for pediatric patients **internationally**?
   a. Yes
   b. No
26. Do you think that the use of Nitrous Oxide Sedation as a behavioural management technique for pediatric patients is ethical?
   a. Yes
   b. No
      • Why (the reason for your answer)?
        ..............................................................................................................................
        ..............................................................................................................................

27. Nitrous Oxide Sedation as a behavioural management technique during pediatric dental care is safe.
   a. Agree
   b. Neutral
   c. Disagree
      • Why (the reason for your answer)?
        ..............................................................................................................................
        ..............................................................................................................................

28. Nitrous Oxide Sedation as a behavioural management technique during pediatric dental care is cost effective.
   a. Agree
   b. Neutral
   c. Disagree
      • Why (the reason for your answer)?
        ..............................................................................................................................
        ..............................................................................................................................

29. What age group do you believe can be treated safely under Nitrous Oxide Sedation? (you can choose more than one answer)
   a. 1-5 yrs
   b. 6-10 yrs
   c. >10 yrs
   d. None

30. Why do you think that Nitrous Oxide Sedation as a behavioural management technique during pediatric dental care is not commonly used in Kuwait (you can choose more than one answer):
   a. Lack of facilities/equipments
   b. Serious side effects of Nitrous Oxide Sedation
   c. Lack of training/knowledge of dentists
   d. Parents disagreement
   e. Child’s refusal
   f. It is illegal
   g. It is unethical
   h. Staff safety (occupational hazards)
   i. Others...............................................................................................................................
31. Do you think that parents are aware of Nitrous Oxide Sedation as a behavioural management technique for their children?
   a. Yes
   b. No

32. Do you think that Nitrous Oxide Sedation is effective for (you can choose more than one answer):
   a. A fearful, anxious child
   b. A disruptive child
   c. A physically compromised child
   d. A mentally compromised child
   e. A child whose gag reflex interferes with dental care
   f. A child for whom profound local anesthesia cannot be obtained
   g. A cooperative child undergoing a lengthy dental procedure

33. Do you think that Nitrous Oxide Sedation is contraindicated for (you can choose more than one answer):
   a. Chronic obstructive pulmonary diseases
   b. Congenital heart defects
   c. Severe emotional disturbances
   d. Kidney diseases
   e. Liver diseases
   f. Drug-related dependencies
   g. Treatment with bleomycin sulphate
   h. Patients taking NSAIDs
   i. Treatment with steroids
   j. Methylene tetrahydrofolate reductase deficiency

Thank you for your participation 😊
السيد: د. يوسف الدويري / وكيل وزارة الصحة المساعد لشؤون طب الأسنان

تحية طيبة وبعد ...،

الموضوع: القيام بدراسة مسحية لأطباء الأسنان وأولياء أمور المرضى الأطفال من قبل طلبة كلية طب الأسنان - جامعة الكويت.

بالإشارة إلى الموضوع أعلاه ...،

نرجو التكرم بالموافقة على عمل دراسة مسحية لأطباء الأسنان العاملين بالقطاع لديكم وأولياء أمور المرضى المراجعين لديكم. علمًا بأن الدراسة تحت إشراف الأستاذ المساعد بكلية طب الأسنان - جامعة الكويت (الدكتور/ محمد عبدالوهاب).

الطالبة: فاطمة الموسي

الطالبة: سارة الكندري

الدكتور محمد عبد الوهاب
Dentists and parents attitude towards the use of nitrous oxide sedation as behavioral management.
برجاء التفضل بالإطلاع والتوجيه بما ترون مناسبًا نحو اعتماد توصية اللجنة والموافقة على مخاطبة الجهات ذات الصلة بموضوع البحث السيد/ة الوكيل المساعد لشؤون طب الأسنان بهذا الشأن للعمل على تسهيل مهمة الباحثين.

مع مراعاة التزامهما بالمحافظة على حقوق المشاركين بالخصوصية وسرية المعلومات وعدم تداولها خارج إطار البحث والحصول على الإقرار المستنير من المشاركين بالبحث حسب الضوابط المنظمة لذلك Informed Consent

وتفضلوا بقبول فائق الاحترام...”

الدكتور/ أوليد خالد الفلاح
الوكيل المساعد لشؤون التخطيط والجودة
رئيس اللجنة الدائمة لتنسيق البحوث الطبية والصحية

مرفق:
- الكتاب الوردي من أ.د. عميد كلية الطب
- بيان تزويدها بالملفات المطلوبة إلكترونيًا
( المراجع 23/ع ك ط /66 )

P.O. Box:(5) 13001 Safat, Kuwait
Tel : 24867159 - 24866724 Fax: 24877957 - 24866739
الموضوع: تسهيل مهمة الطالب/ ساره المهرى والطالبة قصيدة القرصی، اختبار الدکتور/ محمس عیادلولهاب لإجراء بحث كلية طب الاستان

يرجى التفضل بالإحاطة بأن اللجان الفرعية المنفوذة من اللجان الدائمة لتسينق البحوث الطبية والصحية المشكلة بموجب القرار الوزاري رقم 207/2012 تم أوصي بإجماعها المنعقد يوم الأحد الموافق 10/2/2013 بالمواقعة على أجراء البحث المقدم من الطالبة/ ساره المهرى والطالبة/ قصيدة القرصی (إشراف الدکتور/ محمس عیادلولهاب من كلية طب الاستان)

تحت عنوان:

Dentists and Parents attitude towards the use of nitrous oxide sedation as a behavioral management

ويم البحث باستخدام استبيان لجمع البيانات من أطباء الأسنان والوالدين للأطفال بعيادات Informed Consent الأسنان بعد استيفاء الأقرار المستورين من المشاركين بالبحث ولا يتضمن البحث الاطلاع على ملاطب المرضى أو إجراء أي فحوصات أو تداخلات لهم.

لذلك يرجى الموافقة على تصويت اللجان الفرعية وتواصل مخاطبة السيد/ الوکيل المساعد لشن طب الأسنان لعمل على تسهيل مهمة الباحثين مع التزامهما بالموافقة على حقوق المشاركين بالخصوصية وسرية المعلومات وعدم دخولها خارج إطار البحث وحصون على الإقرار المستورين من المشاركين بالبحث حسب الضوابط المنظمة لذلك.

٣٠/١٠/٢٠١٣

نسبة: الدکتور/ عمید كلیة طب الاستان المحترم

أ.د. علاء خضر عابد
عمید كلیة الطب
جامعة الكويت

تم التصوير بواسطة: ضيف ٢٤٩٢٣ ٢٠١٣
السيد: د. فيصل أمير / مدير مركز طب الأسنان - جامعة الكويت المحترم

تحية طيبة و بعد ،،،

الموضوع: القيام بدراسة مسحية لأطباء الأسنان من قبل طلبة كلية طب الأسنان - جامعة الكويت.

بالإشارة إلى الموضوع أعلاه ،،، نرجو التكرم بالموافقة على عمل دراسة مسحية لأطباء الأسنان العاملون بالقطاع لديكم و أولياء أمور المرضى المراجعين لديكم. علمًا بأن الدراسة تحت إشراف الأستاذ المساعد بكلية طب الأسنان - جامعة الكويت (الدكتور / محمد عبدالوهاب).

مع أطيب التمنيات ،،،

Dr. Faisal Amir
Clinical Director
Faculty of Dentalistry

التالفة: سارة الكندي

التالفة: فاطمة الموسي
Principal Investigator (PI): .................................................................

Co-Investigator(s): ................................................................................

Instructor (if student is PI): .................................................................

Research Title: Nitrous oxide sedation as a behavioral management technique during pediatric dental care in Kuwait

Approval of Faculty Research/Ethical Committee: Yes ☑ No (mark a ✓)

Timing and duration of research (avoid time for CDC/CPC Course)

............................................................................................................
............................................................................................................
............................................................................................................

Location for research (eg. cubicle number)

............................................................................................................
............................................................................................................
............................................................................................................

List the clinical instruments, equipment, or data requested

............................................................................................................
............................................................................................................
............................................................................................................

Signature Of PI: .................................................................

Clinical Affairs Committee approval: Yes ☑ No (mark a ✓)

Reasons for non-approval: .................................................................

Signature of Clinical Director: ............................................................ Date 3/13/13
عِبَادَة بسمة كَليِّنج

تحية طيبة و بعد ، ، ،

الموضوع: القيام بدراسة مسحية لأطباء الأسنان و أولياء أمور المرضى الأطفال من قبل طلبة كلية طب الأسنان – جامعة الكويت.

بالإشارة إلى الموضوع أعلاه ، ، ،

نرجو التكرم بالموافقة على عمل دراسة مسحية لأطباء الأسنان العاملون بالقطاع لديكم و أولياء أمور المرضى المراجعين لديكم. علماً بأن الدراسة تحت إشراف الأستاذ المساعد بكلية طب الأسنان – جامعة الكويت ( الدكتور / محمد عبادالوهاب ).

مع أطيب التمنيات ، ، ،

الطالبة: فاطمة الموسي

الطالبة: سارة الكندري

Dr. Mohimna N. Abdulwahab
Assistant Professor
Faculty of Dentistry
Department of Surgical Sciences
عيادة كيدز سمايل

تحية طيبة و بعد ع...

الموضوع: القيام بدراسة مسحية لأطباء الأسنان وأولياء أمور الأطفال من قبل طلبة كلية طب الأسنان - جامعة الكويت.

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مع أطيب التمنيات...
السيدة: د. صبيحة المطوع / مراقبة صحة الفم والأسنان

تحية طيبة و بعد ..

الموضوع: القيام بدراسة مسحية لأطباء الأسنان من قبل طلبة كلية طب الأسنان - جامعة الكويت.

بالإشارة إلى الموضوع أعلاه ..

نرجو التكرم بالموافقة على عمل دراسة مسحية لأطباء الأسنان العاملون بالقطاع لديكم و أولياء أمور المرضى المراجعين لديكم. علماً بأن الدراسة تحت إشراف الأستاذ المساعد بكلية طب الأسنان - جامعة الكويت ( الدكتور / محمد عبد الوهاب ).

مع أطيب التمنيات ..

[ลาย توقيع]

الطالبية: فاطمة الموسي

[ลาย توقيع]

الطالبة: سارة الكندي

[ลาย توقيع]

الدكتور محمد عبد الوهاب

 класс уроков арабского