UNIVERSIDADE ESTADUAL DE CAMPINAS

Faculdade de Odontologia de Piracicaba

KARINA GUEDES DE SOUSA

CARACTERÍSTICAS ALIMENTARES, NUTRICIONAIS E CONDIÇÕES BUCAIS EM CRIANÇAS PRÉ-ESCOLARES EXPOSTAS AO FUMO PASSIVO

FEEDING CHARACTERISTICS, NUTRITIONAL STATUS AND ORAL CONDITIONS IN PRESCHOOL CHILDREN EXPOSED TO SECONDHAND SMOKE

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Tese apresentada à Faculdade de Odontologia de Piracicaba da Universidade Estadual de Campinas como parte dos requisitos exigidos para obtenção do título de Doutora em Odontologia, na Área de Odontopediatria.

Thesis presented to the Piracicaba Dental School of the University of Campinas in partial fulfillment of the requirements for the degree of Doctor in Dentistry, Pediatric Dentistry area.

Orientadora: Profa. Dra. Maria Beatriz Duarte Gavião

Coorientadora: Profa. Dra. Taís de Souza Barbosa

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RESUMO

Os objetivos foram traduzir, adaptar transculturalmente e validar a versão Brasileira do instrumento Parental Feeding Style Questionnaire, e avaliar se o estado nutricional e a condição bucal de crianças pré-escolares podem ser influenciados pela exposição ao fumo passivo e pela forma como são alimentadas. No primeira artigo foi realizado a tradução, adaptação cultural e validação para a versão em Português Brasileiro do Parentall Feeding Style Questionnaire (PFSQ). Nesta fase a amostra constituída por mães de crianças com 36-60 meses de idade, de ambos os sexos, foi subdivida em dois momentos: tradução e adaptação cultural (n=74) e validação (n=204). A confiabilidade interna e a validade do questionário foram examinadas pela análise alfa de Cronbach. O alfa do Cronbach para os domínios variou de 0,65 a 0,82, e reprodutibilidade de 0,69 (ICC). Na validação, o alfa do Cronbach variou de 0,56 a 0,89 entre os domínios, e para os 27 itens o valor foi 0,78. No segundo artigo, a mesma amostra de conveniência constituída de 201 pares de mães e filhos de 48-71 meses de idade, de ambos os sexos, de escolas municipais de Piracicaba/SP. As crianças foram alocadas em 2 grupos: crianças expostas ao fumo passivo (CEFP) ou crianças não expostas (N_CEFP) de acordo com a exposição ao fumo por algum membro da família. Para avaliar como as crianças eram alimentadas, foi aplicada às mães a versão em Português PSFQ. O estado nutricional das mães a das crianças e as condições de saúde bucal das crianças foram determinados. Não houve diferença significativa no aspecto nutricional das crianças em ambos os grupos (*P*> 0,05, Mann Whitney), porém as CEFP apresentam 3,5 mais chances de possuírem um IMC elevado (*P*=0,029). As mães das CEFP apresentaram 10 kg a mais do que as mães das crianças N_CEFP (Mann-Whitney *P*<0,001). Não houve diferença entre o comportamento alimentar das mães (*P*>0,05, Mann Whitney), porém a dinâmica entre os grupos foi diferente: No grupo CEFP houve correlação do IMC da mãe com o da criança (*P*< 0,005), do domínio controle e encorajamento (*P*<0,01) e o domínio emocional com o instrumental (*P* <0,001); no grupo N_CEFP houve correlação do IMC da criança com a idade da mãe (*P*<0.05), do domínio controle e encorajamento (*P*<0.05) ou domínio emocional com o instrumental (*P*<0,001). Apesar de não haver diferença significativa em relação a saúde bucal das crianças (*P*>0,05, Mann Whitney), as CEFP apresentaram 2,28 e 3,68 mais chance de ter cárie quando o IMC da mãe aumentou e quando parentes e mães eram fumantes, independente se fumavam na presença da criança (*P*<0,05). O PSFQ mostrou ser um instrumento válido e confiável para

verificar o estilo dos pais alimentarem seus filho. Concluindo, o estado nutricional das crianças não foi influenciado pela exposição passiva ao fumo, mas pertencer a família e a mãe fumantes aumentou a probabilidade de apresentarem maior IMC. A frequência de cárie dentária foi similar entre os grupos, mas o número de crianças não-ESHS livres de cárie foi maior. O IMC da mãe e ser de família e mãe fumantes aumentaram a probabilidade de presença de cárie dentária.

Palavras-chave: Alimentação, tabaco, saúde bucal, estado nutricional

ABSTRACT

The objectives were to translate, cross-culturally adapt and validate the Brazilian version of the Parental Feeding Style Questionnaire and to evaluate whether the nutritional status and oral condition of preschool children can be influenced by exposure to secondhand smoke and by the way they are fed. First article, the translation, cultural adaptation and validation of the Parentall Feeding Style Questionnaire (PFSQ) into Brazilian Portuguese was carried out. In this stage the sample consisted of mothers of children aged 30-60 months, of both genders, and was subdivided into two stages: translation and cultural adaptation (n=74) and validation (n=204). The internal reliability and validity of the questionnaire were examined by Cronbach's alpha analysis. Cronbach's alpha for the domains ranged from 0.64 to 0.86, and high reproducibility of 0.78 (ICC). At validation, Cronbach's alphas ranged from 0.24 to 0.81 across domains, and 0.65 for their 27 items. In contrast, the emotional and instrumental domains were established in one factor. In the second article, the convenience sample consisted of 201 pairs of mothers and children aged 48 to 71 months old, of both genders, from municipal schools in Piracicaba/SP. The children were allocated into 2 groups: children exposed to secondhand smoke (ESHS) or children not exposed (N_ESHS) according to exposure of a family member to smoke. To assess how the children are fed, the Portuguese version of the PSFQ was applied to the mothers. The nutritional status of the mothers and children and the oral health conditions of the children were determined. There was no significant difference in the nutritional status of the children in both groups ($p > 0.05$, Mann Whitney), but the ESHS were 3.5 more likely to have a high BMI ($p=0.029$). The mothers of the ESHS children had 10 kg more than the mothers of the N_ESHS children (Mann-Whitney $P < 0.0001$). There was no difference between the mothers' eating behavior (> 0.05, Mann Whitney), however the dynamics between the group are different: ESHS - there is correlation of the mother's BMI with that of the child ($p < 0.05$), of the control and encouragement domain ($p < 0.01$) and the emotional domain with the instrumental ($p < .001$); in the N_ESHS group - there is correlation BMI of the child with the mother's age ($p < 0.05$), of the control and encouragement domain ($p < 0.05$) or emotional domain with the instrumental ($p < .001$). Although there was no significant difference in relation to children's oral health (> .05, Mann Whitney), the PSFQs were 2.28 and 3.68 more likely to have caries when the mother's BMI

increased, when relatives and mothers were smokers, regardless of whether they smoked in the presence of the child ($p < .05$). The PSFQ proved to be a valid and reliable instrument to verify the style of parents feeding their children and children exposed to secondhand smoke have a higher risk of developing caries and higher BMI.

Key words: Food, tobacco, oral health, nutritional status

SUMÁRIO

1 INTRODUÇÃO

Hábitos alimentares saudáveis e não saudáveis estabelecidos na infância parecem continuar na vida adulta (Yuan et al., 2016). O desenvolvimento de comportamentos alimentares saudáveis na primeira infância é desejável (van der Horst & Sleddens, 2017), pois a dieta não equilibrada pode acarretar problemas de obesidade e doenças não transmissíveis (Birch & Fisher, 1998; Birch and Davison, 2001; Hughes et al., 2013; Alkerwi et al., 2016; Vaughn et al., 2016; Powell et al., 2017).

Os pais modelam o ambiente alimentar da criança de várias maneiras: por meio da escolha do método de alimentação, pelos alimentos disponíveis e acessíveis, pela exposição à mídia, pela interação com a criança no contexto alimentar e por influência de modelagem direta (Birch & Fisher, 1998; Vaughn et al., 2016). O processo de modelagem direta ocorre pelo fato de a criança observar o comportamento alimentar das pessoas que estão inseridas no seu contexto social alimentar, criando um forte efeito para seleção dos alimentos (Birch & Fisher, 1998).

Quanto à relação da interação com a criança, o estilo dos pais de alimentar os filhos pode influenciar o desenvolvimento do comportamento na alimentação (Birch and Davison, 2001; Hughes et al., 2013; Vaughn et al., 2016). Isso pode se efetivar de acordo com os alimentos que são disponibilizados, bem como pela interação dos pais com os filhos (van der Horst & Sleddens, 2017), tornando-se de importância a qualidade emocional desta interação (Anderson & Keim, 2016; Powell et al., 2017). Há práticas dos pais de alimentar os filhos que podem influenciar negativa ou positivamente o comportamento alimentar da criança, tais como: restrições para controle do peso, pressão para comer, alimento como recompensa emocional, criança controlada ou controle positivo por meio de educação e motivação nutricional baseada no equilíbrio e variedade alimentar (Yuan et., 2016; Anderson & Keim, 2016; Hughes et al., 2013; Vaughn et al., 2016; Powell et al., 2017).

Deste modo, a alimentação infantil pode ser modificada pela exposição e acessibilidade aos alimentos; pela modelagem do comportamento alimentar das pessoas com quem convive; pelas consequências fisiológicas da ingestão de alimentos, levando à restrição alimentar; e pelas práticas da alimentação (Birch & Fisher, 1998). Normalmente, os pais tendem a ter no lar alimentos de sua preferência, os quais podem ser incluídos na dieta dos filhos, formando a base para aceitação alimentar e padrões de ingestão na infância (Birch &

Fisher, 1998, Hughes et al., 2013; van der Horst & Sleddens, 2017). Assim, o paladar das crianças e o consumo de alimentos com alto teor de energia, açúcar e gordura podem ser aprimorados por ambientes onde esses alimentos estejam presentes, consumidos pelos pais ou familiares e/ou tornados indisponíveis periodicamente (Birch & Fisher, 1998; Birch & Davison, 2001; Fisher et al., 2002; Demir & Bektas, 2017).

O comportamento alimentar de pessoas fumantes apresenta maior frequência no desejo de petiscar, especialmente alimentos ricos em gorduras quando comparados a ex- e não fumantes (Chao et al., 2017), como também, maior consumo de alimentos gordurosos e industrializados (Chao et al., 2017). Os efeitos deletérios do tabagismo tanto na saúde geral (Alkerwi et al., 2016; INCA, 2017) quanto na saúde bucal são conhecidos, como o maior risco de desenvolvimento de lesões pré-cancerígenas, maior prevalência e gravidade das doenças periodontais (Leroy et al., 2008). Além disso, atualmente, estudos têm relatado que fumantes de tabaco apresentam maior risco à cárie (Hanioka et al., 2011; Benedetti et al., 2013; Hanioka et al., 2014; Edman et al, 2016; Dhanuka et al., 2019). Observou-se também uma associação positiva entre gestantes fumantes e cárie precoce da infância (Kellesarian et al., 2017).

Fumar está altamente associado a comportamentos de riscos, tais como hábitos alimentares deficientes, promovendo comportamentos relacionados à obesidade, incluindo dieta não saudável (Benedetti et al., 2013; Alkerwi et al., 2016; Chao et al., 2017); menor investimento em autocuidado e, consequentemente, menor frequência de visitas ao dentista (Beneditti et al., 2013; Ojima et al., 2013).

O tabagismo é uma das principais causas de morbidade e mortalidade (Chao et al., 2017). Apesar do declínio deste hábito no Ocidente, fumar constitui grande preocupação mundial em matéria de saúde pública, principalmente entre populações de classe socioeconômicas mais desfavorecidas (Hiscock et al., 2012). No Brasil, cerca de 9,3% da população adulta, entre 35 e 44 anos de idade, fuma; na capital do Estado de São Paulo a prevalência do tabagismo é maior em mulheres, em torno de 10% (Vigitel Brasil 2018, 2019). De acordo com a Secretária Municipal da Saúde (2017) 21% das pessoas acima de 15 anos eram fumantes em Piracicaba em 2009. No ambiente familiar, 26,2% dos escolares têm pelo menos um dos pais ou responsáveis que fumam cigarros em casa e há maior exposição entre os escolares das escolas públicas (27,8%) do que entre os que frequentam escolas privadas (16,7%) (IBGE 2013, 2014).

O tabagismo passivo consiste na exposição à fumaça exalada pelos fumantes (Carvalho Ribeiro et al., 2015; INCA, 2017), tendo um potencial de toxidade maior do que para os própios fumantes (Naeem, 2015), por isto está associada a doenças (de Carvalho Ribeiro et al., 2015; INCA, 2017). De acordo com a Organização Mundial de Saúde (OMS), a maioria desta exposição ocorre no ambiente familiar (Avşar et al., 2008). Entre os fumantes passivos, as crianças abaixo de cinco anos de idade são as mais afetadas, por serem incapazes de modificar esta situação, assim ficando mais expostos à fumaça, principalmente quando o fumante é a mãe ou cuidador (SBP, 2007).

Os fumantes passivos, crianças e adultos, podem apresentar diminuição da concentração do ácido ascórbico (vitamina C) (Avşar et al., 2008; Tanaka et al., 2015) que está associada com o aumento da proliferação da bactéria *S mutans* (Lerroy et al., 2008). Uma das explicações mais plausível para a diminuição da vitamina C é que a inalação da fumaça pelas crianças é composta por uma grande quantidade de radicais livres que reduzem a quantidade de antioxidante do corpo (Strauss, 2001). Além disto, a diminuição desta vitamina está associada a redução da função das glândulas salivares, aumentando o risco à cárie e biofilme visível (Avşar et al., 2008).

A condição de ser fumante passivo tem sido cogitada como um fator de risco da cárie dentária, acometendo principalmente crianças (Hanitoba et al., 2011; Benedetti et al., 2013) que apresentam sistema imonológico imaturo (SBP, 2007). O fumo passivo suprime o sistema imunológico (Vellappally et al., 2007) com a diminuição do nível de IgA e soro IgG na saliva, imunoglobolina G (IgG) sérica, diminuindo, assim, a função das células T auxiliares nas respostas imunológicas do hospedeiro (Moravej-Salehi et al., 2015). Esta supressão pode levar ao aumento do risco à cárie (Vellappally et al., 2007).

Aliado a isto, a interação da susceptibilidade da superfície dentária, carboidratos fermentáveis (açúcar), bactérias e fatores comportamentais, tais como higiene oral precária e o consumo de petiscos ricos em açúcar, podem torná-los preditores para o desenvolvimento inicial da lesão de cárie (Hanitoba et al., 2011).

Alguns estudos relatam que crianças expostas ao fumo passivo apresentaram maior prevalência da doença cárie (Lorey et al., 2008; Hanioka et al., 2008; B Hasmun et al., 2017), com o dobro de risco de desenvolverem cárie em dente decíduo (Tanaka et al., 2015); alteração na pigmentação melânica gengival (Hanika et al., 2005; Yadav et al., 2015); aumento

na concentração de *Streptoccocos Mutans* (Hanioka et al., 2008; Avşar et al., 2008) e Lactobacilus (Avşar et al., 2008), diminuição no pH salivar, no fluxo salivar e na capacidade tampão e aumento na concentração de cotinina (Avşar et al., 2008). Além disso, diferenças no comportamento em saúde, como hábito de escovar os dentes e consumo indiscriminado de carboidratos, foram observados em crianças expostas ao fumo passivo (Tanaka et al., 2015), em consequência do modelo dos hábitos dos pais (Shenkin et al., 2004).

Os estudos têm relacionado a alimentação infantil à experiência precoce com alimentos, sugerindo que as práticas dos pais de alimentar e o ambiente familiar podem estar envolvidos como um fator desencadeante para os problemas de saúde (Alkerwi et al., 2016), como a obesidade (Birch & Fisher, 1998; Birch & Davison, 2001; Hughes et al., 2013; Vaughn et al., 2016; Powell et al., 2017; Demir & Bektas, 2017), a cárie dentária (Leroy et al., 2008) e a preferência por alimentos saudáveis e não saudáveis (Fisher et al., 2002); entretanto, estes estudos não especificam se na população estudada havia pais fumantes e/ou crianças expostas ao fumo passivo.

A compreensão dos determinantes da alimentação, como o comportamento dos pais de alimentar os filhos, pode levar a implementações pertinentes no âmbito de saúde alimentar infantil, voltadas para os programas educacionais preventivos.

Objetivo

Realizar a tradução, adaptação transcultural e validação da versão Brasileira do instrumento Parental Feeding Style Questionnaire para avaliar a maneira como as crianças são alimentadas. Além disto, verificar se o estado nutricional e a condição de saúde bucal das crianças podem ser influenciados pela exposição ao fumo passivo e a forma como são alimentadas.

Esta Dissertação está baseada na resolução da CCPG 002/13, a qual dispõe a respeito do formato das teses de mestrado e doutorado aprovados pela UNICAMP.

2 ARTIGOS

2.1 Translation, Cross-cultural Adaptation and Psychometric Properties of the Parental Feeding Style Questionnaire into Brazilian Portuguese language

Artigo submetido no período Pesquisa Brasileira em Odontopediatria e Clínica Integrada.

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Abstract

This study aimed to translate, cross-culturally adapt and test the psychometric properties of the Parental Feeding Style Questionnaire (PFSQ) to Brazilian Portuguese language. This cross-sectional survey was developed in three stages: (1st) translation and cross-cultural adaptation (n=74); (2nd) reliability (internal consistency and reproducibility); and (3rd) convergent validity for use in Brazilian mothers (n=204). In the first stage, the 27-item PFSQ was translated, back-translated, reviewed by a Committee of Experts and submitted to pretest (n=60). After all questions were understood by more than 85% of mothers, the final translated and cross-culturally adapted version of the PFSQ was self-applied by 42 mothers to test the internal consistency (Cronbach's Alpha Coefficient). Nineteen of 42 mothers answered the instrument again after two weeks to test the reproducibility (Intraclass Correlation Coefficient, ICC). Cronbach's alpha of the subscales ranged from 0.65 to 0.82, and the overall reliability was 0.69, indicating substantial internal consistency. The ICC for overall PFSQ was 0.78, and ranged from 0.56 to 0.89, indicating moderate to excellent reproducibility. All domains have a significant correlation with the overall score. The domain 'control over eating' was positively correlated with 'prompting/encouragement to eat' and negatively with 'instrumental feeding'. 'Prompting/encouragement to eat' was positively correlated with emotional feeding. The Brazilian Portuguese version of the PFSQ is a reliable and valid instrument to assess parental feeding styles.

Keywords: Questionnaire; mothers; children; feeding

Translation, Cross-cultural Adaptation and Psychometric Properties of the Parental Feeding Style Questionnaire into Brazilian Portuguese language

1 Introduction

The development of healthy eating behaviors in early childhood is desirable because an unbalanced diet can lead to problems of obesity and noncommunicable diseases[1-4]. Healthy and unhealthy eating habits established in childhood seem to continue into adulthood[5]. Parents' feeding style can influence the development of eating behavior [2, 6] and children's weight [7]. This can be in accordance with the foods that are made available, as well as by the interaction of parents with their children [4], becoming important the emotional quality of this interaction [3]. Parental feeding practices play an important role in the development of children's food tastes [5] and children´s food behavior[3, 5, 8, 9].

Parental feeding style can be assessed by the Parental Feeding Style Questionnaire (PFSQ)[10, 11, 12]. This instrument was developed in the English language by Wardle et al.[10] to determine four types of feeding styles: 'control over eating', 'prompting/encouragement to eat', 'instrumental feeding' and 'emotional feeding'[10]. Control over eating is when parents control the quality and quantity of food their children consume; prompting or encouraging children to eat means inducing/encouraging them consume a variety of food; instrumental feeding means rewarding children with food if they demonstrate an intended behavior to avoid bad behavior or to ensure healthy eating; and emotional feeding refers to giving food to children in response to feelings such as discomfort and boredom[12,13].

Although the PFSQ has been widely used in other languages and cultures[6, 11, 12, 14-16], a validated instrument remains unavailable in the Brazilian Portuguese language. Furthermore, knowing the determinants of nutrition, such as the behavior of parents feeding their children, can lead to relevant implementations in the prevention of chronic disease and children's oral health. For this reason, this study aimed to translate and perform cross-cultural adaptation of PFSQ into Brazilian Portuguese language; and validate the questionnaire for use in Brazilian mothers.

2 MATERIAL AND METHODS

2.1 Ethical Issues

Written authorization was obtained from the corresponding author of the original questionnaire for translation, cross-cultural adaptation, and validation processes into Brazilian Portuguese language. Education Secretary in the city of Piracicaba, São Paulo, Brazil, authorized the development of the study at public schools. All participants or guardians signed the informed consent form.

This cross-sectional survey is part of a major research project submitted to and approved by the Research Ethics Committee at Piracicaba Dental School, University of Campinas (FOP/UNICAMP), under CAE: 86582318.6.0000.5418 (Annex 1).

This study was developed in three stages: (1st) translation and cross-cultural adaptation; (2nd) reliability (internal consistency and reproducibility; and (3rd) validation of the Brazilian Portuguese version of PFSQ.

2.2 First stage: Translation and Cross-cultural adaptation

2.2.1 Instrument

The PFSQ is a specific and self-administered instrument composed of 27 items that assess the parents' styles of feeding their child (Annex 2). The PFSQ contains four domains: ‘control over eating’ (ten items), ‘prompting/encouragement to eat’ (eight items), ‘instrumental feeding’ (four items), and ‘emotional feeding’ (five items). Figure 1 shows the distribution of the questions according to domains. The items are measured on a 5-point Likert scale that varies from “never” (1 point) to “always” (5 points)[10]. A higher average score on each scale implied a greater tendency for parents to adopt specific styles. Therefore, questions 1, 11, 14, 16 and 23 related to ‘control over eating’ were reversed questions[10].

Domains	Questions									
Control over eating	1	5	11	14	16	17	20	23	24	26
Prompting/Encouragement to eat	3	4	6	8	10	12	19	27		
Instrumental feeding	7	9	18	22						
Emotional feeding	2	13	15	21	25					

Figure 1 - Distribution of PFSQ questions according to domains

2.2.2 Translation and Back translation

The first specific aim was to test the hypothesis that the Brazilian Portuguese version of the PFSQ was well understood by mothers of 24 to 60 months-old children. The procedures were performed according to the internationally recommended guideline to translate the questionnaire into Brazilian Portuguese and to adapt it for Brazilian culture [18]. This process is detailed in Figure 2.

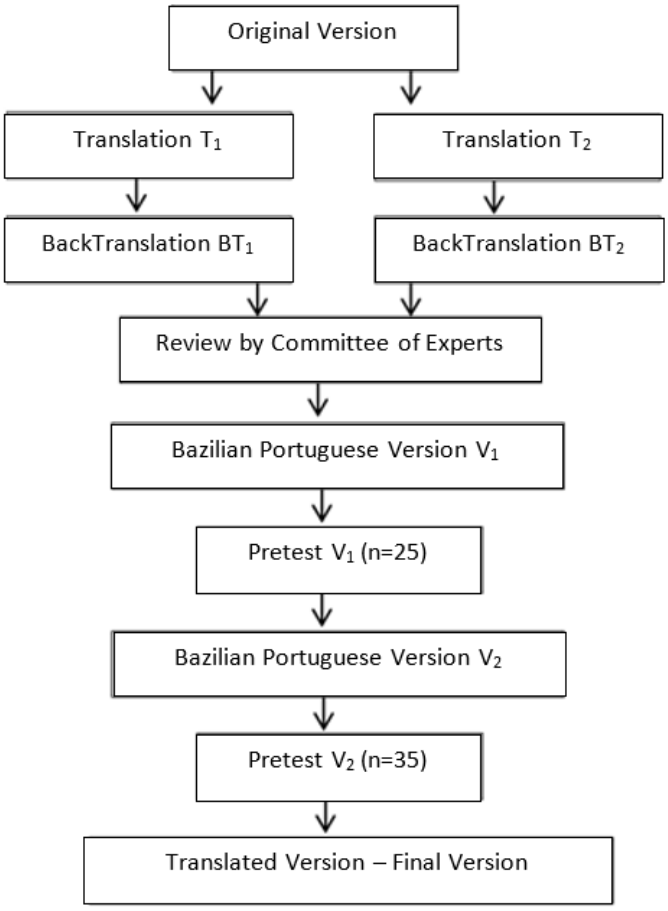

Figure 2 - Flow diagram of the PFSQ translation and cross-cultural adaptation processes.

Initially, the English version of the PFSQ was translated by two independent Brazilian translators who did not know the objective of the study. This translation was done in conceptual form, resulting in translations T1 and T2. After that, two other bilingual English translators, who were unaware of the original text, made the back-translations (BT1 and BT2). Then, a Committee of Experts, two Brazilian pediatric dentists who are English fluent and experienced in questionnaire translations, evaluated the two translations. The third version was made considering semantic, idiomatic, cultural and conceptual equivalences for the comprehension of Brazilian mothers [17-19]. Thus, the first Brazilian Portuguese version (V_1) was obtained.

2.2.3 Cross-cultural adaptation

2.2.3.1 Subjects

This stage was carried out with mothers of 36 to 60 months-old children in Piracicaba city, São Paulo state, Brazil.

The sample size was based on Manzato & Santos[20], requiring about 20 participants for each stage of the pretest.

2.2.3.2 Pretest

V_1 was self-applied by a convenience sample of 25 mothers, not included in the final sample, whose children were patients at the Pediatric Clinic of the Piracicaba Dental School, University of Campinas, Piracicaba, SP, Brazil. An alternative answer option, "I do not understand", was added to each question on the PFSQ. This phase aimed to verify the clarity and conciseness of the questions. To confirm cross-cultural adaptation of the instrument, at least 85% of mothers should not have any difficulty answering each question[18]. In this stage, one question (item 23) was misunderstood by more than 15% of participants and was reassessed by the Committee of Experts and replaced by the same concept without changing its structure and property. After these modifications, the second Brazilian Portuguese version (V_2) was self-applied by another group of 35 mothers (of a total of 49 mothers; answer rate = 71.42%) of children from public schools in the city of Piracicaba, and all questions were understood by more than 85% of the sample. Thus, the socioculturally adapted version of the PFSQ for Brazilian Portuguese was obtained (Appendix 1). The percentages of "I do not understand" answers added to each question during the translation and cross-cultural adaptation process are described in Appendix 2.

2.3 Second stage: Reliability (Internal Consistency and Reproducibility)

The second specific aim was to test the hypothesis that the Brazilian Portuguese version of the PFSQ was reliable to measure the mothers' styles of feeding their child. The final translated and socioculturally adapted version of the questionnaire was self-applied by a sample of 42 mothers, who did not participate of the first stage, to test the internal consistency of the questionnaire, using Cronbach's alpha coefficient [21], as follow: slight ($\alpha \leq$

0.21); fair (0.21 < α <0.40); moderate (0.41 < α 0.60); substantial (0.61< α 0.80) and almost perfect (α>0.80) [22].

Two weeks after the first application, 19 of the 42 mothers were randomly selected to complete the questionnaire again to verify the reproducibility of the instrument (test-retest), using the Intraclass Correlation Coefficient (ICC)[23], as follow: poor (ICC ≤ 0.40); moderate (0.41 < ICC < 0.60); substantial (0.61 < ICC < 0.80); excellent to almost perfect (0.81 < α 1.0)[24].

The sample size calculation for this stage was based on the study by Wardle et al. [10], considering the following Pearson's correlation coefficients (r) for each domain of the questionnaire: 0.83 for 'control over eating'; 0.76 for 'prompting/encouragement to eat'; 0.82 for 'instrumental feeding'; and 0.76 for 'emotional feeding'. Considering the minor correlation coefficient (r=0.76), the test power of 0.85, the alpha level of 0.05, and the correction factor of 1.234, a minimum sample of 16 individuals was needed.

The inclusion criteria were mothers of three- to five-year-old children from public schools in Piracicaba city, São Paulo, Brazil.

2.4 Third stage: Validation

The third specific aim was to test the hypothesis that the Brazilian Portuguese version of the PFSQ was valid to measure the mothers' styles of feeding their child. Construct validity through convergent validity was verified, assuming that most domains would be correlated with the overall score of PSFQ [25, 26, 27].

A sample of 204 mothers of 48 to 60 months-old children from four public schools of Piracicaba participated in this stage. The sample calculation was based on the mean score (SD) of PFSQ overall and the highest standard deviation, 3.33 and 0.70, respectively, from Tam et al.[11,13]. Considering the test power of 0.90, alpha level of 0.05, and correction factor of 1.234, the minimum sample size required was 178 mothers. To compensate for the loss of the sample, approximately 20% mothers were added.

First, pre-structured questionnaires were sent to the mothers to be answered at home, which contained questions related to biological characteristics (age, sex, self-reported race and self-reported weight and height) and socioeconomic factors (education, marital status, employment, family, income)[13]. After that, the PFSQ was self-applied. The BMI of the mothers was calculated to verify the weight status according to the World Health Organization (WHO) standards[28].

2.5 Statistical Analysis

The data were analyzed in SPSS version 23 software, with a significance level of α = 0.05. The results were submitted to descriptive analysis (mean, standard deviation, percentage). To test the reliability of the questionnaire, internal consistency and reproducibility were determined by calculating Cronbach's alpha coefficient [21] and the intraclass correlation coefficient (ICC)[22], respectively. Construct convergent validity was calculated by inter-domain correlations, using Pearson's correlation.

3 RESULTS

3.1 First Stage

During cross-cultural adaptation, the Brazilian Portuguese version was pretested to verify the conciseness of the questions. Only question 23 (*'I let my child eat between meals whenever s/he wants'*) was not understood by 24% of the 25 mothers (*'Eu permito que meu filho (a) coma entre refeições'*) and needed to be rewritten by the Committee of Experts. Then, a new version (V_2) with a modified item was proposed ('*Eu permito que meu filho(a) coma algum alimento no período entre o café da manhã e o almoço e/ou almoço e jantar'*) and pretested in a new sample of 35 mothers (Appendix 2).

3.2 Second Stage

Table 1 shows the reliability results of the PFSQ total and domains. Cronbach's alpha for PFSQ total was 0.78, indicating substantial internal consistency. For the domains, the coefficient ranged from 0.64 for 'instrumental feeding' to 0.86 for 'emotional feeding' when applied first to the 42 mothers and from 0.57 to 0.92 for the same domains in the second application, when 19 mothers answered, indicating 'substantial' to 'almost perfect' internal consistency. The test-retest with 19 mothers showed that the total PFSQ scale presented substantial reproducibility (ICC=0.78) and ranged from moderate 'instrumental feeding' (ICC=0.56) to excellent agreement for 'emotional feeding' (ICC=0.89).

Table 1 – Second stage: reliability of the PFSQ

PFSQ total and domains scores	No. of items	Cronbach's alpha (n=42)	Cronbach's alpha (n=19)	ICC (95%) (n=19)
Control over eating	10	0.77	0.77	0.74
Prompting/Encouragement to eat	8	0.74	0.75	0.67
Instrumental feeding	4	0.64	0.57	0.56
Emotional feeding	5	0.86	0.92	0.89
Total	27	0.78	0.80	0.78

PFSQ, parental feeding style questionnaire; ICC, intraclass correlation coefficient.

3.3 Third Stage

In data analysis, it was found that of the 217 participating mothers, 13 had missing values that did not allow their inclusion in the statistical analyses. Thus, the final sample consisted of 204 mothers whose sociodemographic and anthropometric measures are shown in Table 2.

Table 2 – Third stage: descriptive data for demographic variables (n=204)

	Variable	n	%	mean	SD
	Age (years)			32.12	6.8
	Weight*(kg)			71	14.7
	Height* (m)			1.61	0.1
	BMI			27.14	5.8
Mother	Underweight	4	2		
	Normal weight	75	36.8		
	Overweight	69	33.8		
	Obesity	54	26.5		
	No Information	2	1		
Mother's marital status	Single	50	24.6		
	Married	110	54.2		
	Other	36	17.7		
	No Information	7	3.4		
Mother's educational status	Uneducated	7	3.4		
	1th degree	34	16.7		
	2nd degree	97	47.5		
	Graduated	32	15.7		
	No information	34	16.7		
Income (USA dollar)	D category	62	30.4		
	C category	79	38.7		
	B category	5	2.5		
	No information	58	28.4		

SD, standard deviation; BMI, body mass index

* Due to missing data, the sum of percentages may not equal 100%.

Income category: B ≥ U$1,545.65; C ≥ U$479.06 and D ≥ U$197.20

Confidence interval of 95%.

Table 3 shows the reliability data of the PFSQ. The overall mean (SD) score was 2.91±0.69 and ranged from 1.68±0.81 for 'emotional feeding' to 4.25±0.54 for 'prompting/encouragement to eat'. The overall Cronbach´s alpha for 27 items was 0.69, indicating substantial internal consistency. For domains, the values ranged from 0.65 for 'control over eating' to 0.82 for 'emotional feeding', representing substantial to almost perfect reliability.

Table 3 – Third stage: reliability of the PFSQ (n=204)

PFSQ domains	Number of items	Mean Score (SD)	Cronbach's alpha	Cronbach's Alpha if Item is deleted
Control over eating	10	3.83±0.58	0.65	0.57 - 0.68
Prompting/Encouragement to eat	8	4.25±0.54	0.68	0.60 - 0.67
Instrumental feeding	4	1.85±0.82	0.67	0.51 - 0.66
Emotional feeding	5	1.68±0.81	0.82	0.76 - 0.80
Overall	27	2.91±0.69	0.69	0.65 - 0.68

PFSQ, parent feeding style questionnaire; SD, standard deviation; ICC, intraclass correlation coefficient (confidence interval of 95%)

Table 4 contains the Pearson correlation coefficients between the domains and between each domain with overall score of the PSFQ. All domains have a significant correlation with the overall score. The domain 'control over eating' was positively correlated with 'prompting/encouragement to eat' (P<0.01) and negatively with 'instrumental feeding' (P<0.05), despite the low coefficients. 'prompting/encouragement to eat' was positively correlated with emotional feeding (P<0.01).

Table 4 – Third stage: convergent validity of the PFSQ (n=204)

		Control over eating	Prompting/ Encouragement to eat	Instrumental feeding	Emotional feeding
Control over eating	r	1			
	P-value	-			
Prompting/Encouragement to eat	r	0.40**	1		
	P-value	<0.01	-		
Instrumental feeding	r	-0.17*	-0.08	1	
	P-value	0.014	0.251	-	
Emotional feeding	r	-0.14	-0.10	0.59**	1
	P-value	0.052	0.153	<0.01	-
Overall	r	0.65**	0.61**	0.44**	0.49**
	P-value	<0.01	<0.01	<0.01	<0.01

PFSQ, Parental Feeding Style Questionnaire

* $P < 0.05$, ** $P < 0.01$

4 DISCUSSION

This study was developed in Piracicaba, located in the state of Sao Paulo, Brazil, with an estimated population of 407,252 inhabitants; 30.8% of the population has a per capita income of half minimum wage (class D), and the schooling rate from 6 to 14 years of age is 97.5%[29]. In the present study, approximately 70% of mothers were from socioeconomic classes D and C, and the majority were classified as overweight and obese, corroborating Tam et al.'s [11] and Pimenta et al.'s [30] studies. Moreover, more than half of the mothers had an undergraduate degree, corroborating Tam et al.'s[11] study but contrasting with Pimenta et al.'s [30] study.

To translate a questionnaire, a well-defined methodology must be chosen to have the same effect as the original instrument in the culture being adapted[31]. For that reason, as the methodology of Guillemin et al.[18] has the respective characteristics[31, 32], it was chosen for translation, back-translation, and cross-cultural adaptation of the PFSQ into Brazilian Portuguese language. Additionally, the reliability of the translated instrument was verified by

internal consistency or homogeneity, which checks whether all the components of an instrument measure the same characteristics [21; 33, 34]. The ICC, another reliability criterion, was used to measure the similarity of results obtained at two different times[23, 24,33, 35].

Moreover, Cronbach's alpha coefficient is the most widely used measure to check internal consistency, demonstrating the level of covariance between items on a scale[33], although there is still no consensus on its interpretation. Some studies determine that values higher than 0.7 are ideal[36, 37], whereas others consider values below 0.70 - but close to 0.60 - as satisfactory[23], as used in the present study. In the second stage of this study, the PFSQ overall scale showed substantial internal consistency and reproducibility in both applications. For domains, a range from substantial to almost perfect homogeneity and from moderate to almost perfect agreement was observed. These preliminary analyses predicted satisfactory reliability for the Brazilian Portuguese version of the PFSQ, and a larger sample was necessary to confirm these findings.

To ensure that the new version demonstrates the measurement properties required for the intended application[19], in the third stage, the Brazilian Portuguese version of the PFSQ was applied to a new sample of 204 mothers. Overall, the PFSQ showed substantial internal consistency. For domains, the values ranged from substantial to almost perfect reliability, corroborating Wardle et al.'s [10] study. In addition, other translations of the PFSQ, such as European Portuguese[30], Chinese[11], Turkish[38] and Dutch translate versions[39], found similar results ranging from 0.67 to 0.88, 0.63 to 0.82, 0.64 to 0.80 and 0.64 to 0.80, respectively. Despite cultural differences, the present results are in agreement with others[10, 30, 38, 39], demonstrating that mothers seem to practice controlling overeat and prompting or encouraging eating during feeding, since these domains were significantly higher than instrumental and emotional feeding. In addition, all domains were significantly correlated with the overall score of the PFSQ, meaning that the domains have the same evaluation trend in relation to the studied phenomenon[27], that is, the adequacy existing between the chosen variables and the theoretical concept to be measured [40].

Wardle et al.[10] reported higher levels of 'control over eating' and 'prompting/encouragement to eat' and lower levels of 'instrumental feeding' and 'emotional feeding', corroborating the present findings, which found a significant gradient in domains, that is: 'prompting/encouragement to eat' > 'control over eating' > 'instrumental feeding' > 'emotional feeding' mean scores. In Chinese culture, mothers reported higher levels of control

overeating during feeding practice, followed by 'prompting/encouragement to eat', 'instrumental feeding' and 'emotional feeding' [11]. Additionally, in European Portuguese culture, mothers more frequently reported permissiveness, 'control over eating', and 'prompting/encouragement to eat', with less frequent 'instrumental feeding' and 'emotional feeding' [30]. Although in Turkish culture [38], the most practiced feeding style was prompting/encouragement to eat and restrictive control, due to the internal dynamics of the society, the control over eating domain had a subdivision of restrictive control in which parents do not concede choices to their children regarding their feeding. This restrictive control was followed by 'emotional feeding', permissive control over eating and 'instrumental feeding'. Despite cultural differences, parents/caregivers tend to encourage their children to eat new and/or healthy foods through established family rules. Then, the reliability during the validation for the Brazilian Portuguese version was satisfactory, making the PFSQ adequate to assess parental feeding style to be used in other groups in Brazil.

Some limitations should be stated concerning the present findings, especially the fact that this research had a convenience sample: low-income and education mothers of four- and five-year-old children from public schools in Piracicaba, São Paulo, limiting the generalization of the results. Further studies with mothers with a variety of educational, social and cultural characteristics, as well as with other designs, such as longitudinal and clinical trials, are needed to confirm important psychometric properties, e.g., external validity and responsiveness of the PFSQ.

The Brazilian Portuguese version of the PFSQ was cross-culturally adapted for Brazilian Portuguese language, since the respective steps followed the theoretical framework of Guillemin et al., that is, translation, back translation, review by experts and pretesting. The questionnaire showed to be easy for application and can be an important tool for evaluation of eating behaviors in early childhood. Nevertheless, other psychometric properties of this version need to be evaluated to ensure its effectiveness and accuracy, such as discriminant, criterion and/or correlational validity, and responsiveness.

5 CONCLUSION

The Brazilian Portuguese version of the PFSQ is a reliable and valid instrument to assess parental feeding style.

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Author Contributions

All authors contributed to the study conception and design. Additionally, for material preparation, data collection and analysis were performed. The first draft of the manuscript was written by KARINA GUEDES DE SOUSA and MARIA BEATRIZ DUARTE GAVIÃO. All authors commented on previous versions of the manuscript. All authors read and approved the final manuscript.

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2 ARTIGOS

2.2 Feeding characteristics, nutritional status, and oral conditions in preschool children exposed to secondhand smoke

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Abstract

The aim of this study was to evaluate whether the nutritional status of preschool children can be influenced by secondhand smoke exposition, by the way they are fed and if there is any possible difference of their oral health conditions. The convenience sample consisted of 201 pairs of mothers and children aged 4 to 5 years old, of both genders, from municipal schools in Piracicaba/SP. The children were allocated into 2 groups: children exposed to secondhand smoke (ESHS) or children not exposed (N_ESHS) according to exposure of a family member to smoke. To assess how the children are fed, the Portuguese version of the PSFQ was applied to the mothers. According to the World Health Organization (WHO), the nutritional status of the mothers and children and the oral health conditions of the children were determined. There was no significant difference in the nutritional status of the children in both groups ($p > 0.05$, Mann Whitney), but the ESHS were 3.5 more likely to have a high BMI ($p=0.029$). The mothers of the ESHS children had 10 kg more than the mothers of the N_ESHS children (Mann-Whitney $P < 0.0001$). There was no difference between the mothers' eating behavior (> 0.05, Mann Whitney), however the dynamics between the group are different: ESHS - there is correlation of the mother's BMI with that of the child ($p < 0.05$), of the control and encouragement domain ($p < 0.01$) and the emotional domain with the instrumental ($p < .001$); in the N_ESHS group - there is correlation BMI of the child with the mother's age ($p < 0.05$), of the control and encouragement domain ($p < 0.05$) or emotional domain with the instrumental ($p < .001$). Although there was no significant difference in relation to children's oral health (> .05, Mann Whitney), the PSFQs were 2.28 and 3.68 more likely to have caries when the mother's BMI increased, when relatives and mothers were smokers, regardless of whether they smoked in the presence of the child ($p < .05$). Children exposed to secondhand smoke have a higher risk of developing caries and higher BMI could be caused by the parents feedind style.

Keyword: food, children, cigarettes, oral health

Feeding characteristics, nutritional status, preferred food and oral conditions in preschool children exposed to secondhand smoke

Introduction

The eating habit is influenced by environmental factors, such as community, society, media, family, and food offering (Scaglioni et al., 2018). The preschool age, considered the critical window stage, is the period that influences a child's physical and cognitive health and development, core to which is their nutrition (Scaglioni et al., 2018; Liao and Deng, 2021). Dietary habits are shaped at a young age and maintained during later (Montaño et al., 2015), and unhealthy diet may be a long-term risk factor for obesity and non-communicable diseases (Powell et al., 2016; Scaglioni et al., 2018).

Parents' eating habits and eating practices may be the primary determinants of children's family system and food choices (Scaglioni et al., 2018) through the foods they make available and how they interaction with each other (van der Horst and Sleddens, 2017). Parents' feeding style is based on the parent responding in a sensitive and responsive way to the child´s emotional behavior (Hughes et al., 2013), classifying parents into 4 styles: authoritative (high warmth, high control), authoritarian (low warmth, high control), indulgent (high warmth, low control) and uninvolved (low warmth, low control) (Maccoby & Martin, 1983).

Parents' lifestyle could be a potential determinant to food choosing and, thus, food offering (van der Horst & Sleddens, 2017; Demir & Bektas, 2017; Dolwick & Persky, 2021). As to lifestyle habits, smokers report a higher frequency of snack cravings, especially high-fat foods compared to former and non-smokers (Chao et al., 2016), especially higher intake of fat predominantly saturated and mono-unsaturated fat, corresponding with a higher consumption of processed meat, and a lower intake of fruit and vegetables (Zyriax et al., 2018).

Exposed second-hand smoke (ESHS), passive smokers or environmental smokers, is one of the most important and most widespread exposures in the indoor environment affecting globally 1% of the global burden of disease worldwide (WHO, 2020). In Brazil, at least 26.2% of schoolchildren were passive smokers at home and this exposure was higher among

public schoolchildren (27.8%) than among those attending private schools (16.7%) (IBGE, 2013). Currently, the percentage of passive smokers over 18 years of age at home was 7.6%.

Household smokers do not only affect the physiology of children who are exposed to it but also has adverse effects on their general and oral health (Dhanuka et al., 2019). Passive smoking children may show poor oral health, emulating their parents (Tanaka et al., 2015); a lack of toothbrushing, poor dietary habits such as irregular consumption of sweets, and low fluoride exposure (Tanaka et al., 2015); change in gingival melanic pigmentation (Yadav et al., 2015); increase in *Streptoccocci mutans* concentration (Hanioka et al., 2008; Avşar et al., 2008) and Lactobacilus, decrease in salivary pH, salivary flow and buffer capacity (Avşar et al., 2008). Moreover, smoker mothers are considered an indicator of risk for caries in preschool age children (González-Valero et al., 2018; Dhanuka et al., 2019; Lee et al., 2020), increasing the risk of caries by twice as much as children who are not exposed to smoke (Tanaka et al., 2015; B Hasmun et al., 2017) or any household smokers (Tanaka et al., 2010).

Studies have referred infant feeding to early experience with food, suggesting that parental feeding practices and the family environment may be involved in the process of health problems (Alkerwi et al., 2016), such as obesity (Hughes et al, 2013; Powell et al., 2016; Demir & Bektas, 2017), and the preference for healthy and unhealthy foods (Fisher et al., 2002); however, these studies do not specify whether there were smoking parents and/or children exposed to secondhand smoke in the study population.

Parental behavior can be a determining factor in the diet and oral health of children. Thus, understanding how parents feed their children can implement preventive strategies for both oral and general child health. For this reason, the aim of this study was to evaluate whether the nutritional status of preschool children can be influenced by secondhand smoke exposition, by the way they are fed and if there is any possible difference of their oral health conditions.

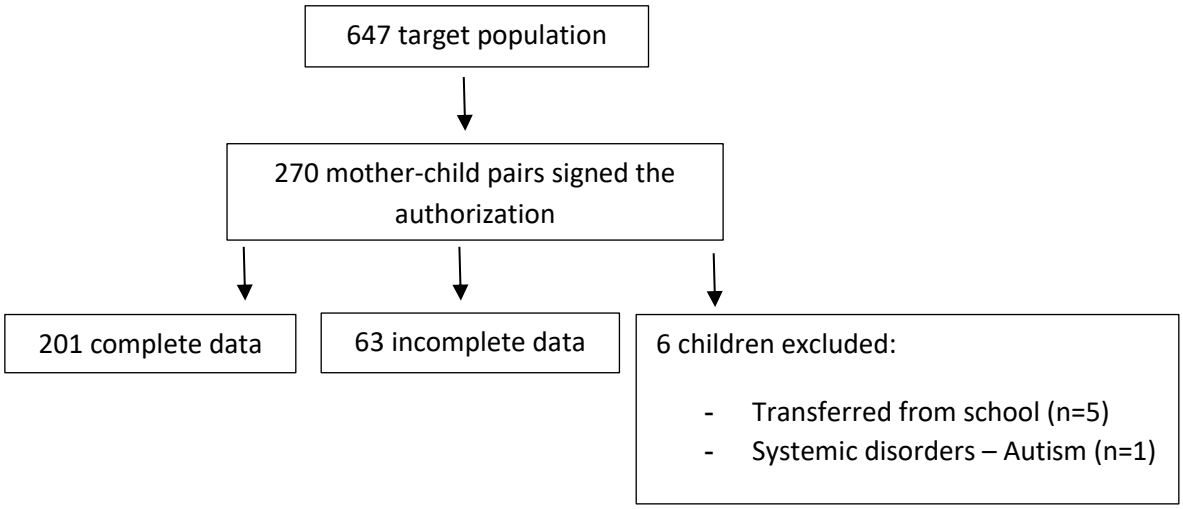
Material and Methods

The project was approved by the Research Ethics Committee of the Piracicaba Dental School, University of Campinas (FOP-UNICAMP), protocol number 2.657.941 CAE: 86582318.6.0000.5418 (Annex 1).

Subjects

The sample consisted of 201 mother-child pairs recruited from public schools of Piracicaba, São Paulo, Brasil. Figure 1 shows the process of the sample selection. Briefly, 647 mother-child pairs were invited to participate and received the Free and Informed Consent Term (TCLE). Two-hundred and seventy TCLE returned and then the respective mothers received a self-applied questionnaire about biological characteristics, socio-economic factors dental history of the children (Demir et al., 2017). From the 270 eligible participants, 63 presented incomplete data and six were excluded according to criteria cited below.

Figure 1 – Flowchart of the sample selection



Inclusion criteria: mother-child dyads, with children aged from four to five years (six incomplete), duly enrolled in the public preschools of Piracicaba, São Paulo, Brazil.

Exclusion criteria: children with dietary restriction, allergy or intolerance to any food related to this study; children with systemic disorders that may compromise the masticatory system, such as neurological disorders, cerebral palsy and among others; chronic diseases; inappropriate behavior and/or refusal to cooperate in the evaluation of the proposed variables. The information was given by the parents/guardians and in case of doubt the pediatrician were consulted to confirm the diagnosis.

Children were considered as exposed to secondhand smoke (ESHS) if any family member or caregiver smoked in their presence, resulting in two groups: (1) children exposed

to secondhand smoke (ESHS) or (2) children not exposed (Not_ESHS). Moreover, it was verified whether the mother was a smoker, how many people in the family are smokers, and how many cigarettes a day the mother, family members or caregivers smoked in the presence of the child.

Children of ESHS group were classified according to the amount of exposure to smoke:

- "Highly exposed" (Exposure > 10 cigarettes/day);
- "Moderately Exposed" (Exposure between 6-10 cigarettes/day);
- “Slightly Exposed" (Exposure between 1-5 cigarettes/day) and
- "Occasionally exposed" (Exposed to smoke, but not daily).

The total amount of cigarettes smoked in the child's presence during the day was considered regardless of the number of smoking family members (Avşar et al., 2008; Montaldo et al., 2011).

Evaluation of parental feeding style – *Parental Feeding Style Questionnaire (PFSQ)*

PFSQ is a specific and self-applied instrument, composed of a total of 27 items, with responses options using a 5-point Likert scale ranging from “never” (1 point) to “always” (5 points). The higher the score, the greater the tendency for parents to adopt a particular eating style. The PFSQ was translated and socioculturally adapted into Brazilian Portuguese according to Guillemin et al. (1993) by our working team (article in submission).

The questionnaire consists of four domains (Wardle et al., 2002; Demir & Bektas, 2017):

1. Control over eating: is when parents control the quality and quantity of the foods that their children consume
2. Encouragement/prompting to eat: means inducing / encouraging children to eat
3. Instrumental feeding: rewarding children with food to avoid bad behavior or ensure a healthy diet
4. Emotional feeding: giving foods to children in response to feelings such as uneasiness and boredom

Anthropometric assessment

The anthropometric assessment of the children took place at school, out of doors in daylight but not direct sunlight. Weight and height measurement were performed following standardized norms by the World Health Organization (WHO) (WHO, 1999). The weight was obtained using a digital scale and the height using a portable stadiometer/ measuring tape. The Body Mass Index (BMI) calculation is the ratio between weight (in kilograms) and height (in meters) squared - BMI = weight/height^2. The limit of normality is established by WHO curves and BMI Z-scores according to age and sex by graphs. The weight and height of the mothers were self-declared, and the BMI calculated to verify the nutritional status according to WHO.

Oral conditions

All selected children underwent a clinical oral examination using instruments of routine in the dental clinic (dental mirror, gingival probe with round ended and protective supplies), which was performed by one trained and calibrated examiner (SCCJ). The examinations took place at the school, out of doors in daylight but not direct sunlight.

The evaluation of oral conditions consisted of clinical examination of dental caries, gingivitis, malocclusion according to the premises of the World Health Organization (WHO, 1999) and oral hygiene practice. The diagnosis of dental caries was complemented by the diagnosis of active and inactive white spot lesions, drying the dental surface with gauze. The presence of visible biofilm was evaluated in buccal surfaces of primary upper incisors, without the use of dye (Bonanato et al., 2010).

Parents / guardians of children who needed dental treatment received a letter to refer them to the FOP-UNICAMP graduation clinic.

Statistical analysis

The data were analyzed in the software SPSS version 23, with a significance level of $\alpha = 0.05$. Data distribution was verified by the Kolmorogov-Smirnov test. The results were submitted to descriptive analysis (mean, standard deviation, percentages). The t-test and Mann-Whitney test were applied, when indicated, for comparisons. The proportions were compared with Fisher's Exact and Chi-square tests, when indicated. Spearman's correlation

matrix was constructed between the age and BMI of children and their mothers and PSFQ domains. Two logistic regression models were constructed, considering children's BMI as dependent variables for the first model (normal weight = 0, overweight / obesity = 1) and for the second model, dental caries (absence = 0, presence = 1). The independent variables in the first model were:

1) exposure to secondhand smoke (children Not_ESHS=0, children ESHS=1),
2) sex (girls=0, boys=1),
3) mothers' BMI (normal weight=0, overweight/obesity=1),
4) mothers' marital status (married=0, others=1),
5) smoker mother (no=0, yes=1),
6) smoking family and mothers (no=0, yes=1), and
7) PSFQ domains as ordinal variables.

In the second model, the independent variables were the same and the following variables were added:

8) dental caries in the family (absence=0, presence=1),
9) presence of visible biofilm (absence=0, presence=1).

Family income and mothers' education were not included in the models, due to missing values. The univariate logistic regression was used to test associations of each independent variable and the dependent binary variables. Then, two multivariate logistic regression models were built, including all significant independent variables at $P<0.05$ and non-significant ones at $P<0.20$, with exposure to secondhand smoke being forced into the model.

Results

Table 1 shows demographic characteristics of the two groups, ESHS children and Not_ESHS children, and their mothers. Mothers of ESHS children presented BMI significantly higher than the Not_ESHS ones. In the Not_ESHS group, two mothers were smokers and there were eight families with smokers, but they not smoked in the presence of the children. The number of cigarettes per day that the children in the ESHS group were exposed ranged from one to five, so they were classified as "Slightly Exposed".

Table 1: Demographic characteristics of the sample

			ESHS children (n=64)	Not_ESHS children (n=137)
Children	Age (months)	*Mean (SD)*	58.86(6.01)	58.50 (7.17)
		*Median (25%-75%) **	59 (54 - 63)	58 (53 - 64.50)
		Range	48 – 71	48 - 71
	Weight (kg)	*Mean (SD)*	21.12 (4.69)	19.80 (3.79)
		*Median (25%-75%) **	19.85 (17.87 - 24.22)	19.6 (16.95 - 22.25)
		Range	13.8 - 36	10 - 31.7
	Height (cm)	*Mean (SD)*	112.96 (6.43)	111.63 (10.17)
		*Median (25%-75%) **	113 (109.25 - 117)	113 (108 - 117)
		Range	98 - 128	23.9 - 126
	BMI	*Mean (SD)*	16.26 (2.82)	15.67 (2.01)
		*Median (25%-75%) **	15.6 (14.57 - 18.21)	15.29 (14.48 - 16.82)
		Range	5.6 - 24.7	8.4 - 21.4
	Weight status [N (%)]	Underweight	1 (1.6)	1 (1.6)
		Normal weight	41 (64.1)	95 (69.3)
		Overweight	11 (17.2)	22 (16.1)
		Obesity	11 (17.2)	12 (8.8)
Mothers	Age (years)	*Mean (SD)*	34.02 (6.56)	31.24 (6.68)
		*Median (25%-75%) **	34 (30 - 37)	32 (26 - 36)
		Range	21 – 65	17 - 53
	Weight (Kg)	*Mean (SD)*	**78.11 (15.69)** †	**67.78 (13.02)** †
		*Median (25%-75%) **	76 (67.25 - 89.5)	67 (57.47 - 76)
		Range	45 - 135	41 - 110
	Height (m)	*Mean (SD)*	1.64 (0.07)	1.61 (0.08)
		*Median (25%-75%) **	1.6 (1.6 - 1.7)	1.6 (1.6 - 1.7)
		Range	1.5 - 1.8	1.2 - 1.8
	BMI	*Mean (SD)*	**29.43 (5.61)** ‡	**26.22 (5.60)** ‡
		*Median (25%-75%) **	29.1 (25.4 - 33.5)	25.9 (22.72 - 29.3)
		Range	20.3 - 46.7	0.30 - 41.9
	Weight status [N (%)]	Underweight	-	3 (2.2)
		Normal weight	15(23.4)	58 (42.3)
		Overweight	24 (37.5)	46 (33.6)
		Obesity	25 (39.1)	35 (21.9)
	Marital Status [N (%)]	Single	14 (21.9	36 (26.3)
		Married	39 (60.9)	72 (52.6)
		Others	10 (15.6)	27 (19.7)
		Uneducated	1 (1.6)	5 (3.6)
	Educational Status [N (%)]	1° degree	12 (18.8)	24 (17.5)
		2° degree	33 (51.6)	63 (46)
		Graduated	13 (20.3)	21 (15.3)
		No information	5 (7.8)	24 (17.5)

Table 1 continued

			ESHS children (n=64)	Not_ESHS children (n=137)
Mothers	Income [N (%)] *	D class	20 (31.1)	45 (32.8)
		C class	20 (31.1)	58 (42.3)
		B class	1 (1.6)	3 (2.2)
		No information	23 (35.9)	31 (22.6)
Smoking conditions	Smoker mothers		22	2
	Number of families with smokers		64	8
	Number of smokers per family [N (%)]	0	1 (1.6)	127 (92.7)
		1	33 (51.6)	7 (5.1)
		2	20 (31.3)	2 (1.5)
		3	10 (15.6)	0
	Number of cigarettes per day the child is exposed [N (%)]	1	11 (17.2)	
		2	-	-
		3	13 (20.3)	-
		4	15 (23.4)	-
		5	25 (39.1)	-

ESHS: exposed to secondhand smoke; not_ESHS: not exposed to secondhand smoke

†, Weight mothers of ESHS children significantly higher than mothers of Not_ESHS children – Mann-Whitney P< 0.0001

‡, BMI mothers of ESHS children significantly higher than mothers of Not_ESHS children – *t* Test P=0.0002

* D class = USD $381- R$ 761,00; C class = USD $762,77- R$ 1.905,00; B class = USD $ 1906 – R$ 3.829,00 – IBGE.

The descriptive values of the PFSQ scores are in Table 2 and distributed according to the domains and groups. There was no significant difference between ESHS and Not_ESHS children in each domain values, neither between overall scores ($P > 0.05$).

Table 2 - Descriptive data of PFSQ domains for ESHS and Not_ESHS children

	PSFQ domains	Number of items	Mean Score (SD)	Median	First -Third Quartile (25%-75%)	Range
Mothers of ESHS children (n=64)	Control over eating	10	3.88±0.51	3.9	3.5 - 4.3	2.6 - 4.8
	Encouragement/Prompting	8	4.27±0.62	4.37	4.03 - 4.75	1 - 5
	Instrumental feeding	4	1.79±0.76	1.75	1 - 2.18	0.75 - 4
	Emotional feeding	5	1.58±0.74	1.2	1 - 2	1 - 3.8
	Overall scores	27	2.89±0.44	2.87	2.61 - 3.18	1.93 - 4.05
Mothers of Not_ESHS children (n=137)	Control over eating	10	3.79±0.6	3.9	3.4 - 4.2	1.8 - 5
	Encouragement/Prompting to eat	8	4.21±0.58	4.2	3.8 - 4.6	0.75 - 5
	Instrumental feeding	4	1.85±0.80	1.7	1 - 2.5	0.75 - 4
	Emotional feeding	5	1.70±0.81	1.4	1 - 2.2	0.8 - 1
	Overall scores	27	2.91±0.37	2.84	2.67 - 3.16	1.86 - 4.05

PFSQ, Parent Style Feeding Questionnaire
ESHS: exposed to secondhand smoke; not_ESHS: not exposed to secondhand smoke

Table 3 shows the correlation coefficients between the anthropometric variables, PFSQ domains for ESHS and Not_ESHS children. For ESHS children, BMI was positively correlated with their mother's BMI, as well as the domains Control over eating with 'Encouragement/Prompting to eat' and Instrumental feeding with Emotional feeding.

Positive and negative correlations were observed between variables in Not_ESHS children, highlighting the negative correlations between child´s age with domains Instrumental and Emotional feeding, Child's BMI was positively correlated with 'Instrumental feeding' domain and mother's age with 'Encouragement/Prompting to eat' domain. For PSFQ domains, only 'Encouragement/Prompting to eat' with 'Instrumental feeding' were not

significantly correlated. Furthermore, all PSFQ domains were positively correlated with overall PSFQ score for both ESHS and Not_ESHS children.

Table 3 - Correlation matrix for anthropometric variables, PFSQ domains in ESHS children and Not_ESHS children

	Child's age	Child's BMI	Mother's age	Mother's BMI	Control	Encoura-gement	Emotio-nal	Instru-mental
ESHS (n=64)								
Child's age	—							
Child's BMI	0.236	—						
Mother's age	0.015	-0.128	—					
Mother's BMI	0.160	**0.281***	-0.096	—				
Control	0.061	-0.082	0.025	0.155	—			
Encouragement	0.174	-0.093	0.003	0.089	0**.342****	—		
Emotional	-0.010	0.018	-0.013	-0.164	-0.081	-0.150	—	
Instrumental	0.024	-0.076	0.128	-0.029	0.008	0.184	**0.500*****	—
Overall PSFQ	0.112	-0.07	0.068	0.051	**0.678*****	**0.539*****	**0.465*****	**0.55*****
Not_ESHS (n=137)								
Child's age	—							
Child's BMI	0.153	—						
Mother's age	**0.265****	-0.069	—					
Mother's BMI	-0.021	0.044	0.086	—				
Control	0.037	-0.004	-0.031	-0.026	—			
Encouragement	0.075	-0.027	**0.239****	-0.067	**0.39*****	—		
Emotional	**-0.333*****	0.018	-0.069	0.051	**-0.234****	**-0.204***	—	
Instrumental	**-0.213***	**0.198***	-0.114	-0.006	**-0.242****	-0.105	**0.617*****	—
Overall PSFQ	-0.17	0.057	-0.021	-0.04	**0.559*****	**0.591*****	**0.379*****	**0.417*****

* $P < 0.05$, ** $P < 0.01$, *** $P < 0.001$ obtained from Spearman's correlation test.

PSFQ domains:

Control - Control over eating

Encouragement - Encouragement/Prompting to eat

Emotional - Emotional feeding

Instrumental - Instrumental feeding

The characteristics of oral health and oral hygiene are presented in Table 4. The dmft did not show significant difference between ESHS and Not_ESHS children. However, the number of Not_ESHS children caries-free was significantly higher than those ESHS. Similar differences were found for white spot lesions; despite the low number, the proportion of ESHS children with white spot lesions was significantly lower than the Not_ESHS ones. In addition, the toothbrush frequency was the same for all children (table 6).

Table 4 - Descriptive characteristics of oral health and oral hygiene

	ESHS children (n=64)	Not_ESHS children (n=131)	*P*-value
dmft [mean (SD)]	0.88±3.07	0.94±2.22	> 0.05[§]
Caries free [n (%)]	17 (26.56) *	54 (39.41) *	<0.001[#]
White spots lesions	0 (0) *	0.9 (.284) *	<0.001 [ł]
Presence of visible biofilm [n (%)]	32 (50)	63 (46)	>0.05[#]
Toothbrush frequency [mean (SD)]	2.5±0.642	2.58±0.897	0.540[§]

SD, standard deviation
[§] *t* test
[ł] Levene test/Binomial test
[#] Chi-squared

The results of univariate logistic regression considering the dependent variable “Child’s BMI” showed that the independent variables with *P* values less than 0.20 were ‘exposure to secondhand smoke’, ‘mothers’ BMI’ and ‘smoking family and mothers`. The other categorical variables did not reach the assumptions of the logistic regression (*P* >0.05), neither the scores of PSFQ domains (*P* >0.05). The only variable that remained significant in the final model was ‘Smoking family and mothers’ (Table 5), meaning that the probability of having a high BMI was 3.5 times greater for children whose family and mothers were smokers, independently whether they smoke in the child's presence.

Table 5. First model of multiple logistic regression, considering "Child's BMI" as the dependent variable

Dependent variable – BMI children	*Overall Model Test p=0.015*		χ^2 (3) =10.4						
						95% CI		Collinearity	
	Coefficient	SE	Z	*P*	OR	Lower	Upper	VIF	Tolerance
Intercept	-1.541	0.304	-5.07	< .001	0.214	0.118	0.389	-	-
Exposure to secondhand smoke	-0.608	0.571	-1.06	0.288	0.545	0.178	1.669	2.87	0.349
Mother's BMI	0.610	0.354	1.72	0.085	1.841	0.919	3.687	1.03	0.974
Smoking family and mothers	1.255	0.574	2.19	0.029	3.506	1.138	10.800	2.85	0.351

CI, confidence interval OR, Odds ratio R^2_N=0.073

Table 6 shows the final model for multivariate logistic regression, considering dental caries as dependent variable. It was seen previously that variables 'smoker mother' and 'smoker family' presented *P*-values less than 0.20 in the univariate logistic regression, but during construction of the final logistic regression model they did not fit well and were excluded. In this context, the independent variables 'mother's BMI' and 'smoking family and mothers' remained significative in the model, showing that the probability of having dental caries was 2.28 and 3.68 times greater when the BMI of mothers increases and when family and mothers were smokers, independently whether they smoke in the child's presence.

Table 6. Multivariate logistic regression, considering dental caries as the dependent variable

Dependent variable – Dental caries	*Overall Model Test p= 0.009*		χ^2 (5) =15.4						
						95% CI		Collinearity	
	Coefficient	SE	Z	*P*	OR	Lower	Upper	VIF	Tolerance
Intercept	-2.441	0.433	-5.64	< .001	0.087	0.0373	0.203	-	-
ESHS/Not_ESHS	-0.821	0.624	-1.32	0.188	0.440	0.1296	1.495	2.93	0.341
Mother's BMI	0.825	0.400	2.06	**0.039**	**2.283**	1.0429	4.997	1.05	0.948
Mother's marital status	0.599	0.355	1.68	0.092	1.820	0.9066	3.652	1.03	0.972
Smoking family and mothers	1.301	0.620	2.10	**0.036**	**3.675**	1.0895	12.393	2.87	0.349
Biofilm	0.484	0.357	1.35	0.175	1.622	0.8057	3.265	1.04	0.964

CI = confidence interval OR = Odds ratio R^2_N= 0.112

Discussion

Despite the percentage of adult smokers in Brazil is decreasing especially in the last decades, from 34.8% in 1989 to 9.3% in 2018 – being males 12.1% and females 6.9%, smoking and passive smoking are an important risk factors for the development of chronic diseases. Consequently, smoking is still the global leader among the causes of preventable deaths (Vigitel, 2019; WHO, 2020). It is important to mention that children who live with a smoker, although they report not smoking indoors, are still in risk of exposure (Merianos et al., 2018). Passive smoking children were more likely to have had any medical care visit including sick care, checkups, or physical examinations than non-passive smoking children (Merianos et al., 2018).

In this study, 31.84% of children were considered exposed to a secondhand smoke, a percentage considered high in comparison with a sample of São Paulo city, SP, Brazil, in which 8% of children aged 0-8 years were exposed to smoke (Vigitel, 2019). Maybe the differences can be attributed to the different methods for evaluating the respective exposure, since since the latter was based on a telephone survey (Vigitel, 2019), while a self-administered questionnaire was used in the present study. Furthermore, particularities in the smoking habit of each evaluated population, from the cities of Piracicaba and São Paulo (Vigitel, 2019), could also explained the differences found.

Mothers from a smoker family environment showed significant higher weight and BMI than the mothers from families without this habit, with a large rate of overweight and obesity. Unhealth eating habits are frequent among smokers, since they have reported a higher frequency of snack cravings, especially high-fat foods, compared to non-smokers (Alkerwi et al, 2016; Chao et al., 2016; Zyriax et al., 2018; Monteiros dos Santos, 2021). The nicotine modifies smokers' sense of taste, then foods high in sugar and fat and processed food become more palatable (Beck et al., 2018).

In the ESHS group, the BMI of the child and the mother were positively correlated, suggesting similar eating behavior between them. According to Pasztak-Opiłka et al. (2020), maternal BMI was a significant predictor of eating behaviors and knowledge of nutrition, and mothers with normal body weight were characterized by a higher level of positive eating behaviors. In this context, the domains 'Control over eating' with 'Encouragement/Prompting

to eat' were correlated, meaning that the mothers should control the food consume, inducing the children to eat different foods. In this way, there was a positive correlation between the domains 'Emotional eating' and 'Instrumental eating', showing that mothers could be using food as emotional comfort and reward for their children. Overweight parents are more likely to report using food as a reward for their children and try to regulate their children's emotions using food (Dolwick & Persky, 2021).

On the other hand, for Not_ESHS children positive and negative correlations occurred between variables. First, the age of the child and the mother were positively correlated, which in turn were correlated with some PSFQ domains, as follows: 'Encouragement/Prompting to eat' was positively correlated with mother's age, which means that as the mother's age increases, the incentive for children to consume a variety of foods becomes more evident. Conversely, Liao & Deng (2021) found that young caregivers tended to offer more healthier foods than older caregivers. In this context, 'Instrumental feeding' and 'Emotional feeding' showed inverse correlation with child's age. Although the age range of the studied sample has been small, children around five years probably needed less reward for eating and less food in response to negative feelings than children aged four years. Significant positive correlation for Not_ESHS children was observed between child's BMI and 'Instrumental feeding', thus the instrumental feeding style of parents in offering food to obtain the desired behavior could be considered an influencing factor on child's weight status. In fact, there is some evidence that parents who provide healthy eating behavior to their children are less likely to include rewards in their infant feeding styles (Dolwick & Persky, 2021).

Furthermore, as found in ESHS children, the domains 'Control over eating' with 'Encouragement/Prompting to eat' were positively correlated, as well as the domains 'Emotional eating' and 'Instrumental eating'. Since child's BMI was positively correlated with 'instrumental feeding in this group', it is possible to infer that a less-favorable eating habits could have been established, as observed by Lo et al. (2015), because unhealthy food has a more appealing smell and taste than fruits and vegetables, as rewards for children's behaviors or to relieve their emotion (Lazarte et al., 2012). According to Dolwick & Persky (2021), parents who self-reported a greater tendency towards reward-based eating opted for ultra-processed foods for their children, inducing excessive consumption.

In line with those positive inter-domain correlations, in Not_ESHS children the domain ‘Control over eating’ was negatively correlated with ‘Emotional feeding’ and ‘Instrumental feeding’, as well as ‘Encouragement/Prompting to eat” and ‘Instrumental feeding’. Perhaps, mother’s feeding styles of Not_ESHS children have been successful by controlling or stimulating a proper food ingestion. ‘Control over eating’ and ‘Encouragement/Prompting to eat’ have been associated with higher intake of fruits and vegetables (Lo et al., 2015; Wang et al., 2017). Nevertheless, it must take into account that encouragement can also contribute also to a higher consumption of dairy products and control to lower consumption high fat food, as previously observe by Lo et al. (2015). Beyond this, the effectiveness in the style of encouraging to eat can be considered similar to eating control (Lo et al., 2015). Although the present study did not assess the types of foods offered by the mothers, encouraging the intake of new foods does not necessarily imply offering only healthy foods, but offering a variety of healthy foods and industrialized foods with a high content of fat and carbohydrates as well, agreeing with Lo et al. (2015).

All domains in both groups were positively correlated with overall PSBQ score, showing an adequacy between the questionnaire and the respective measurement of parents’ behavior in feeding their children (Fiorin et al., 2019).

As highlighted previously in this study, parental behavior can be a determining factor in the diet and oral health of children, and parental/family smoking conditions can be an influencing factor on oral conditions. It is well known by the literature that children of mothers who smoke may have poorer dental health behaviors including reduced toothbrushing frequency, lower use of fluoride toothpaste, less help with toothbrushing higher consumption of meal snacks and beverages at night (Leroy et al. 2008; Hanioka et al. 2011; González-Valero et al., 2018; Dhanuka et al., 2019; Lee et al., 2020). In the present study, there was no significant difference in dfmt and daily frequency of toothbrushing between ESHS and Not_ESHS children. Meanwhile, the number of Not_ESHS caries-free children was significantly higher than ESHS children even though the opposite were found for white spot lesions. These results are noteworthy for their low caries index when compared to the national average of 2.43 teeth with caries experience of caries in 5-year-old children (SB Brasil, 2010). These finding could infer two situations. First, nicotine concentration is related to age, due to metabolic reasons (Lopez et al., 2003) that is, the younger the individual, the faster nicotine is

metabolized in the body, consequently, deleterious effects of nicotine on the oral cavity may be minimized. Second, the health educational strategies implemented in public education services could have been effective in maintaining the oral and nutritional health of children.

To observe the probability of the variables studied to influence nutritional status of children and their oral conditions, regressions models were built. In the first logistic regression model, it was observed that children whose family and mothers were smokers were 3.5 times more likely to have a high BMI. Probably, the dynamic of feeding children exposed to smoking was confirmed, since unhealthy eating habits could be seen in smokers, with higher consume of high-fat foods, as commented above (Alkerwi et al, 2016; Chao et al., 2016; Zyriax et al., 2018; Santos, 2021). Thus, in this sample, being exposed or not to secondhand smoke was not a factor that influenced the nutritional status of children, but the family environment and respective habits may have played an influencing role. Also, the fact that children were young and exposed to five or less cigarettes per day, considered as slightly exposed, could be determined the lack of association of both groups with the BMI.

In this study, the mother's BMI and being from family and mother who smoke determined higher probability of having dental caries, 2.13 and 2.37 times, respectively. It is known that maternal BMI can be a predictor of children's eating behavior (Pasztak-Opiłka, 2020), which in turn may be involved in the etiology of dental caries, as an unhealthy diet is a determining factor. In relation to family and mother who smoke, the same consideration about an unhealth diet can be pointed out, that it could have contributed to increase the probability of having dental caries. Corroborating that, previous studies observed that children who are exposed to second-hand smoke during infancy had about two times higher probability of having caries in their primary teeth (Tanaka et al., 2015; B Hasmun et al., 2017; González-Valero et al., 2018). Despite the above consideration about nicotine metabolism in the body of young children (Lopez et al., 2003; Lee et al., 2020), nicotine may contribute to the binding of Streptococcus mutans to oral structures, increasing the risk of developing dental caries (Hanioka et al., 2008; Avşar et al., 2008; Liu et al., 2018).

The strengths of this study include the large and homogeneity sample size. However, there are some limitations. First this study analyzed the children exposed to a secondhand smoke, not only for smoker mothers. Secondly, all children were from public school where

there are different educational politic systems compared to private schools. Further studies should be performance measuring the cotinine concentration to verify its influence on children's oral health and eating behavior.

Conclusion

The parental feeding style was the same for ESHS and Not_ESHS children. Furthermore, the nutritional status of preschool children was not influenced by secondhand smoke exposition, but smoking family and mother increased the probability of heaving greater BMI, even they did not smoke in child's presence. Despite of the frequency of dental caries was the same for both groups, the number of caries free Not-ESHS children was greater than ESHS children. Finally, the mother's BMI and to be of smoking family and mother, even they did not smoke in child's presence, increased the probability of heaving dental caries.

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DISCUSSÃO

Objetivando avaliar o estado nutricional das crianças pré-escolares pode ser influenciado pela exposição ao fumo passivo, pela maneira que são alimentadas e se há alguma possível diferença na condição de saúde bucal, este trabalho foi realizado em duas fases: primeira – tradução, adaptação cultural e validação do PFSQ; e a segunda – avaliação das variáveis supracitadas.

Uma metodologia bem estabelecidada na literatura (Guillemin et al., 1993) foi escolhida para a realização da tradução, retradução, adaptação cultural do PFSQ para o Português Brasileiro (Barbosa et al., 2010; Agostinho et al., 2019). Além disso, a confiabilidade do instrumento traduzido foi verificada pela consistência interna aplicando o coeficiente alfa de Crombach´s, que verifica se todos os componentes de um instrumento medem as mesmas características (Souza et al., 2017; Gottems et al., 2018). Outro critério, também utilizado neste estudo, foi o coeficiente de correlação intraclasse (ICC) que verifica a similaridade dos resultados obtidos em dois momentos diferentes (Streiner et al., 2003; Souza et al., 2017). De acordo com a análise apresentada neste estudo, o PFSQ mostrou alta confiabilidade, com o coeficiente alfa de Crombach´s de 0,78 e 0,8, na primeira e segunda aplicações, respectivamente, e ICC de 0,78 (artigo 1 - tabela 2). Estes valores estão de acordo com Tam et al. (2014), que validaram o PFSQ para a língua Chinesa. Assim, a versão do PFSQ em português brasileiro foi obtida.

Para garantir que esta nova versão apresentasse as propriedades de medição necessárias para a aplicação pretendida (Beaton et al., 2000), a versão traduzida do PFSQ foi aplicada a uma amostra maior com diferentes mães (n=204). As propriedades psicométricas e a correlação sub-escala (domínios) desta versão foram aceitáveis (artigo 1 - tabela 4) quando comparadas com o instrumento original (Wardle et al., 2002), como também as versões traduzidas para o Português (Portugal) (Pimenta et al., 2019), Chinês (Tam et al., 2014), Turco (Özçetin et al., 2010) e Holandês (Sleddens et al., 2010). Assim, a confiabilidade durante a validação do PFSQ para a versão em Português Brasileiro foi satisfatória, tornando-o adequado para avaliar o estilo de alimentação dos pais.

Na mesma amostra crianças exposta ou não ao fumo passivo, o estilo de alimentar dos pais, o estado nutricional e a condição de saúde bucal foram estudados pela primeira vez em Piracicaba, São Paulo, Brasil. De acordo com a Organização Mundial de Saúde (OMS), uma

dieta e alimentação saudáveis ajudam a prevenir todas as formas de má nutrição, bem como doenças não transmissíveis (DNT), tais como diabetes e doenças cardiovasculares (WHO, 2020).

A maneira dos pais alimentatem os filhos não difereu entre os grupos, porém o IMC das mães influenciou a forma que as crianças são alimentadas. As mães de crianças expostas ao fumo passivo fumantes passivas apresentaram um IMC maior do que as mães das crianças não expostas ao fumo passivo, com significância estatística. Mesmo as mulheres sendo mais susceptíveis a adotorem um padrão alimentar mais saudável do que os homens (Monteiros Dos Santos et al., 2021), o ambiente familiar e o estilo de alimentar dos pais é um fator determinante na modulação do hábito alimentar de uma pessoa (Scaglioni et al., 2018; Dhanuka et al., 2019; Liau &Deng, 2021). Assim, essas mães fumantes ou exposta a famílias fumantes adquiram seus hábitos alimentares tendo como referências seus pais (Liau &Deng, 2021). Esta dinâmica baseia-se na teoria social de aprendizagem na qual o comportamento alimentar é o resultado de uma combinação da imitação das crianças do comportamento alimentar dos seus pais e do estilo saudável dos seus pais as alimentarem (Liau & Deng, 2021).

De acordo com análise de correlação, as mães do grupo das crianças não exposta ao fumo passivo, apresentam uma correlação ao estilo de alimentar “Controle sobre comer” e “Incentivo a comer”. O estilo “Controle sobre comer” e “Incetivo a comer” são características de pais autoritários que tendem a oferecer mais alimentos saudáveis aos seus filhos. Além disto, o estilo “Controle sobre comer” e “Incentivo a comer” foi correlacionado a idade das mães. De acordo com Liao & Deng (2021) mães com idade entre 30-45 anos tende a oferecer aos filhos alimentos mais saudáveis.

No grupo das crianças expostas ao fumo passivo, observou-se que o IMC das mães está correlacionado com o IMC da criança, determinando a maneira como são alimentadas. De acordo com Pasztak-Opiłka (2020), o IMC materno é um preditor significativo no comportamento alimentar; consequentemente, o IMC correspondente ao sobrepeso ou à obesidade tende a indicar um estilo alimentar compensatório, ou seja, o uso do alimento para suprir as emoções das crianças (Dolwick & Persky, 2021). Este comportamento compensatório é caracterizado por insegurança e ansiedade ambivalente, preditor do estilo “Emocional”, com o impacto negativo no comportamento alimentar devido a pessoa comer excessivamente a fim de reduzir seu estresse, melhorando, assim, seu estado emocional (Pasztak-Opiłka, 2020).

Os alimentos pouco saudáveis têm aroma e sabor mais apelativos do que as frutas e legumes e por serem mais palatáveis podem ser os alimentos de escolha usados como recompensa pelo comportamento das crianças ou para aliviar a sua emoção (Lazarte et al., 2012; Lo et al., 2015; Dolwick & Persky, 2021). Estes aspectos estão de acordo com os resultados referente ao fato que as crianças expostas ao fumo passivo apresentaram probabilidade 3,5 maior de apresentarem IMC mais alto.

Além disto, a saúde bucal é outro fator que pode ser afetado pelo ambiente familiar. Crianças de mães que fumam podem ter comportamentos de saúde oral mais deficientes, incluindo redução da frequência de escovação, menor uso de pasta de dentes fluoretadas, menos ajuda na escovação e consumo de mais lanches e bebidas à noite (Leroy et al. 2008; Hanioka et al. 2011; Dhanuka et al., 2019). Em contraste, neste estudo não foi achado diferença em relação aos hábitos de saúde bucal e na condição da saúde bucal das crianças avaliadas. Esses achados podem refletir os resultados de intervenções educativas de saúde bucal efetivas em escolas públicas de Piracicaba. Entretanto, as crianças expostas ao fumo passivo e o IMC das mães são determinantes para aumentar a chance em 2,13 e 2,37 vezes, respctivamente, do desenvolvimento da doença cárie. O aumento da frequência e da quantidade de alimentos com alta densidade energética, cariogênicos, aumenta o risco para o desenvolvimento de doença cárie, como também de doenças não comunicáveis, como a obesidade. O cultivo de hábitos alimentares saudáveis desde a infância não só contribui significativamente para o crescimento pessoal e a saúde futura dos adultos, mas também estabelece uma base importante para a saúde social global (Liao e Deng, 2021).

4 CONCLUSÃO

O “*Parental Feeding Style Questinnaire*” na versão em português brasileiro mostrou ser válido e confiável para verificar o estilo dos pais alimentatem seus filhos. Não houve diferença entre a maneira que as crianças, expostas ou não ao fumo passivo, eram alimentadas pelos seus pais. Além disso, o estado nutricional das crianças em idade pré-escolar não foi influenciado pela exposição ao fumo passivo, mas ser de família e mãe fumantes, mesmo que não fumassem na presença da criança, contribuiu para a chance de IMC mais elevado. Apesar da frequência da cárie dentária ser a mesma para ambos os grupos, o número de crianças livres de cáries não expostas ao fumo passivo foi maior do que o das crianças expostas. Finalmente, o IMC da mãe e o fato de ser de família e mãe fumantes, mesmo que estes não fumassem na presença da criança, aumentou a probabilidade de ocorrer cárie dentária.

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* De acordo com as normas da UNICAMP/FOP, baseadas na padronização do International Committee of Medical Journal Editors - Vancouver Group. Abreviatura dos periódicos em conformidade com o PubMed.

APÊNDICES

APÊNDICE 1

Parent Feeding Style Questionnaire Brazilian Portuguese Version

QUESTIONÁRIO SOBRE OS HÁBITOS ESCOLHIDOS PELOS PAIS PARA ALIMENTAÇÃO DA CRIANÇA

Por gentileza, leia as seguintes afirmações e marque um X na caixa que mostra como você lida com a alimentação de seu filho (a). É importante lembrar que não há respostas certas ou erradas; nós estamos interessados em saber o que os pais realmente sentem e fazem.

	Nunca	Raramen-te	Às vezes	Frequente-mente	Sempre
1) Eu permito que meu filho(a) escolha quais alimentos quer comer nas refeições.	☐	☐	☐	☐	☐
2) Eu ofereço alimentos ao meu filho(a) para que ele(a) se sinta melhor quando está chateado (a).	☐	☐	☐	☐	☐
3) Eu incentivo meu filho(a) a esperar o momento certo das refeições.	☐	☐	☐	☐	☐
4) Eu elogio meu filho(a) quando ele come os alimentos que eu ofereço.	☐	☐	☐	☐	☐
5) Eu decido quantos lanches meu filho(a) deve comer.	☐	☐	☐	☐	☐
6) Eu incentivo meu filho(a) a comer uma grande variedade de alimentos.	☐	☐	☐	☐	☐
7) Para conseguir que meu filho(a) se comporte bem, eu prometo dar algo para comer.	☐	☐	☐	☐	☐
8) Eu coloco a comida de forma atrativa para o meu filho(a).	☐	☐	☐	☐	☐
9) Se meu filho(a) se comporta mal, eu o proíbo de comer o que mais gosta.	☐	☐	☐	☐	☐
10) Eu incentivo meu filho(a) a experimentar cada alimento servido nas refeições.	☐	☐	☐	☐	☐
11) Eu permito que meu filho(a) se retire da mesa durante a refeição.	☐	☐	☐	☐	☐
12) Eu incentivo meu filho(a) a experimentar alimentos que ele nunca comeu antes.	☐	☐	☐	☐	☐
13) Eu ofereço alimentos para o meu filho(a) para ele(a) se sentir melhor quando está machucado.	☐	☐	☐	☐	☐
14) Eu permito que meu filho(a) decida quando ele(a) quer fazer a refeição.	☐	☐	☐	☐	☐
15) Eu ofereço alimentos ao meu filho(a) quando ele(a) está se sentindo entediado (a).	☐	☐	☐	☐	☐
16) Eu permito que meu filho(a) decida quantos lanches são suficientes para ele (a).	☐	☐	☐	☐	☐
17) Eu decido qual é o momento certo para que meu filho(a) coma o lanche.	☐	☐	☐	☐	☐
18) Eu ofereço doces como forma de recompensa para que meu filho(a) coma a refeição principal.	☐	☐	☐	☐	☐
19) Eu incentivo meu filho(a) gostar do que está comendo.	☐	☐	☐	☐	☐

20) Eu decido os horários de alimentação do meu filho(a).	☐	☐	☐	☐	☐
21) Eu ofereço alimentos ao meu filho(a) para que ele se sinta melhor quando está preocupado(a).	☐	☐	☐	☐	☐
22) Eu ofereço alimentos como recompensa ao meu filho(a) quando ele(a) se comporta bem.	☐	☐	☐	☐	☐
23) Eu permito que meu filho(a) como algum alimento no período entre o café da manhã e o almoço e/ou almoço e jantar.	☐	☐	☐	☐	☐
24) Eu insisto para que meu filho(a) faça as refeições à mesa.	☐	☐	☐	☐	☐
25) Eu ofereço alimentos ao meu filho(a) para que ele(a) se sinta melhor quando está bravo.	☐	☐	☐	☐	☐
26) Eu decido o que meu filho(a) come entre as refeições.	☐	☐	☐	☐	☐
27) Eu elogio meu filho(a) quando ele(a) experimenta um novo alimento.					

APÊNDICE 2

Percentage of the answer 'I do not understand' added to each question during the pretest applications. Only questions with this answer are shown.

PFSQ domains and questions	1st Aplication① % (n=25)	2nd Aplication② % (n=35)
Control over eating		
Question n° 5	4.00	2.85
Question n° 6	8.00	5.71
Question n° 7	8.00	-
Question n° 8	8.00	14.48
Prompting/Encouragement to eat		
Question n° 10	-	-
Question n° 11	-	-
Question n° 13	4.00	8.57
Question n° 15	8.00	11.42
Question n° 16	4.00	5.71
Question n° 17	4.00	2.85
Question n° 18	4.00	-
Instrumental Feeding		
Question n° 19	4.00	-
Question n° 21	8.00	5.71
Question n° 22	4.00	2.85
Emotional Feeding		
Question n° 23	24.00	2.85
Question n° 25	4.00	11.42

PFSQ, parental feeding style questionnaire

①: Pretest for V_1; ②: first pretest for V_2

ANEXOS

ANEXO 1

PARECER APROVAÇÃO DO COMITÊ DE ÉTICA E PESQUISA (CEP)

UNICAMP - FACULDADE DE ODONTOLOGIA DE PIRACICABA DA

PARECER CONSUBSTANCIADO DO CEP

DADOS DO PROJETO DE PESQUISA

Título da Pesquisa: Características alimentares, nutricionais e condições bucais em crianças pré-escolares expostas ao fumo passivo.

Pesquisador: KARINA GUEDES DE SOUSA

Área Temática:

Versão: 4

CAAE: 86582318.6.0000.5418

Instituição Proponente: Faculdade de Odontologia de Piracicaba - Unicamp

Patrocinador Principal: Capes Coordenação Aperf Pessoal Nivel Superior

DADOS DO PARECER

Número do Parecer: 2.657.941

UNICAMP - FACULDADE DE ODONTOLOGIA DE PIRACICABA DA

Continuação do Parecer: 2.657.941

Folha de Rosto	folhaDeRosto.pdf	07/03/2018 14:54:38	KARINA GUEDES DE SOUSA	Aceito

Situação do Parecer:
Aprovado

Necessita Apreciação da CONEP:
Não

PIRACICABA, 16 de Maio de 2018

Assinado por:
jacks jorge junior
(Coordenador)

ANEXO 2

Parental Feeding Style Questionnaire

Please read the following statements and tick the appropriate boxes to show how you deal with feeding your child. It is important to remember that there are no right or wrong answers to these questions, we are interested in what parents really feel and do.

	Never	Rarely	Some-times	Often	Always
I allow my child to choose which foods to have for meals	☐	☐	☐	☐	☐
I give my child something to eat to make him/her feel better when s/he is feeling upset	☐	☐	☐	☐	☐
I encourage my child to look forward to the meal	☐	☐	☐	☐	☐
I praise my child if s/he eats what I give him/her	☐	☐	☐	☐	☐
I decide how many snacks my child should have	☐	☐	☐	☐	☐
I encourage my child to eat a wide variety of foods	☐	☐	☐	☐	☐
In order to get my child to behave him/herself I promise him/her something to eat	☐	☐	☐	☐	☐
I present food in an attractive way to my child	☐	☐	☐	☐	☐
If my child misbehaves I withhold his/her favourite food	☐	☐	☐	☐	☐
I encourage my child to taste each of the foods I serve at mealtimes	☐	☐	☐	☐	☐
I allow my child to wander around during a meal	☐	☐	☐	☐	☐
I encourage my child to try foods that s/he hasn't tasted before	☐	☐	☐	☐	☐
I give my child something to eat to make him/her feel better when s/he has been hurt	☐	☐	☐	☐	☐
I let my child decide when s/he would like to have her meal	☐	☐	☐	☐	☐
I give my child something to eat if s/he is feeling bored	☐	☐	☐	☐	☐
I allow my child to decide when s/he has had enough snacks to eat	☐	☐	☐	☐	☐
I decide when it is time for my child to have a snack	☐	☐	☐	☐	☐
I use puddings as a bribe to get my child to eat his/her main course	☐	☐	☐	☐	☐
I encourage my child to enjoy his/her food	☐	☐	☐	☐	☐

	Never	Rarely	Some-times	Often	Always
I decide the times when my child eats his/her meals	☐	☐	☐	☐	☐
I give my child something to eat to make him/her feel better when s/he is worried	☐	☐	☐	☐	☐
I reward my child with something to eat when s/he is well behaved	☐	☐	☐	☐	☐
I let my child eat between meals whenever s/he wants	☐	☐	☐	☐	☐
I insist my child eats meals at the table	☐	☐	☐	☐	☐
I give my child something to eat to make him/her feel better when s/he is feeling angry	☐	☐	☐	☐	☐
I decide what my child eats between meals	☐	☐	☐	☐	☐
I praise my child if s/he eats a new food	☐	☐	☐	☐	☐

ANEXO 3

COMPROVANTE SUBMISSÃO ARTIGO 1

Submission Confirmation

Print

Thank you for your submission

Submitted to	Pesquisa Brasileira em Odontopediatria e Clínica Integrada
Manuscript ID	PBOCI-2022-0011
Title	Translation, Cross-cultural Adaptation and Psychometric Properties of the Parental Feeding Style Questionnaire into Brazilian Portuguese language
Authors	de Sousa, Karina Gavião, Maria Beatriz Ultremari, Natalia Chaves Junior, Samuel de Carvalho Barbosa, Taís
Date Submitted	16-Jan-2022

Author Dashboard

ANEXO 4

COMPROVANTE DE SIMILARIDADE (TURNITIN)

Tese Karina

RELATÓRIO DE ORIGINALIDADE

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ANEXO 5

FOLHA DE APROVAÇÃO

UNIVERSIDADE ESTADUAL DE CAMPINAS

Diretoria Acadêmica

CERTIFICADO DE CONCLUSÃO

Nome		**Registro Acadêmico**	
Karina Guedes de Sousa		150485	
RG - Registro geral (Identidade)	**CPF**	**Nascimento**	**Sexo**
001197652 - SSP/RN	008.489.424-50	31/08/1980	Feminino
Naturalidade		**Nacionalidade**	
Natal-RN		BR	

Dados do Ingresso	**Nível**
Curso: 64 - Doutorado em Odontologia	Doutorado
Área de Concentração	
AN - Odontopediatria Reconhecido pela Portaria MEC n° 609 de 14/03/2019	
Forma de Ingresso	**Data de Ingresso**
Religamento para Defesa de Tese	15/03/2021

Certificado
Certifico, para os devidos fins, que o[a] interessado[a] concluiu o curso de Pós-Graduação acima especificado, com defesa e aprovação de sua Tese em 19/01/2022. A referida defesa de sua Tese encontra-se em fase de homologação.