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**INFLUÊNCIA DE FATORES SOCIAIS INDIVIDUAIS E COMUNITÁRIOS NA  
QUALIDADE DE VIDA RELACIONADA A SAÚDE BUCAL DE CRIANÇAS:  
UMA COORTE DE 7 ANOS**

Santa Maria, RS  
2018

**Jessica Klöckner Knorst**

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COORTE DE 7 ANOS**

Dissertação apresentada ao Curso de Mestrado do Programa de Pós-Graduação em Ciências Odontológicas, Área de Concentração em Odontologia, ênfase em Odontopediatria, da Universidade Federal de Santa Maria (UFSM, RS), para a obtenção do grau de **Mestre em Ciências Odontológicas**.

Orientador: Prof. Dr. Thiago Machado Ardenghi

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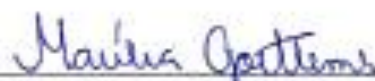
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Thiago Machado Ardenghi, Dr. (UFSM)  
(Presidente da Banca/Orientador)



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Fernanda Tomazoni, Dra. (UFSM)



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Marília Leão Goettens, Dra. (UFPel)

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*Dedico este trabalho aos meus pais, José Antônio e Marlene, por todo amor, carinho e incentivo em todos os dias da minha vida.*

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“Por vezes sentimos que aquilo que fazemos não é senão uma gota de água no mar. Mas o mar seria menor se lhe faltasse uma gota.”

(Madre Teresa de Calcutá)

## RESUMO

### INFLUÊNCIA DE FATORES SOCIAIS INDIVIDUAIS E COMUNITÁRIOS NA QUALIDADE DE VIDA RELACIONADA A SAÚDE BUCAL DE CRIANÇAS: UMA COORTE DE 7 ANOS

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Os estudos sobre as desigualdades em saúde bucal têm recebido uma nova perspectiva, onde são utilizados desfechos de saúde orientados para o paciente, como a autopercepção de saúde bucal e a qualidade de vida relacionada a saúde bucal (QVRSB). A QVRSB resulta da interação entre as condições de saúde bucal, saúde geral, fatores individuais, sociais e contextuais. Diversos estudos têm evidenciado a importância de examinar as características da vida social e o papel da privação social na QVRSB. Entretanto, a maioria desses estudos tem delineamento transversal, o que limita relação de causa-efeito. Visto que fatores na infância refletem na vida adulta, o objetivo desse estudo é avaliar a influência de fatores sociais individuais e comunitários na QVRSB de crianças. Esse estudo trata-se de um estudo de coorte o qual foi projetado com 639 crianças (de 1 a 5 anos de idade) que foram avaliadas em 2010 na cidade de Santa Maria, RS, Brasil. No acompanhamento, após sete anos, todos os indivíduos foram novamente convidados a participar do estudo, e um total de 449 crianças (uma taxa de resposta de 70,3%) foram reavaliadas. A QVRSB, foi avaliada no acompanhamento através da versão brasileira do *Child Perception Questionnaire* (CPQ 8-10). As variáveis exploratórias foram coletadas durante o *baseline* e incluíram: presença de associações de classe, associações de trabalhadores e centros comunitários culturais no bairro (nível contextual); redes sociais individuais; variáveis sociodemográficas e medidas de saúde bucal. Os dados foram analisados utilizando modelos de regressão de Poisson multinível para investigar a influência entre as características individuais e contextuais na QVRSB ao longo do período de estudo. A idade média das crianças avaliadas no acompanhamento foi 10 anos (desvio padrão; 1,4). Crianças que viviam em áreas com associações de classe no *baseline* relataram uma melhor QVRSB no acompanhamento (IRR 0,82; IC 95% 0,72-0,94). Em relação às variáveis individuais, o sexo feminino, o baixo nível socioeconômico, o não envolvimento dos pais nas atividades escolares, a visita ao dentista por dor de dente e a presença de overjet acentuado foram associados a maiores pontuações gerais no CPQ8-10. O capital social individual e comunitário exerceram influência na QVRSB. Crianças que moravam em bairros com alto capital social e cujos pais tinham altos níveis de redes sociais individuais reportaram melhor QVRSB. Esse conhecimento é importante no planejamento de políticas públicas de saúde para melhorar a saúde e o bem-estar das crianças e pode fornecer aos formuladores de políticas informações úteis sobre a importância da comunidade e das relações sociais, visando melhorar a QVRSB ao longo da vida.

**Palavras-chave:** Capital social. Criança. Estudo longitudinal. Qualidade de vida. Saúde bucal.

## ABSTRACT

### INFLUENCE OF INDIVIDUAL AND NEIGHBORHOOD SOCIAL FACTORS ON CHILD ORAL HEALTH-RELATED QUALITY OF LIFE: A 7-YEAR COHORT STUDY

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Lately, oral health inequalities studies have approached a new perspective. In this perspective, patient-reported health outcomes, such as oral health self-perception and oral health-related quality of life (OHRQoL), have been used. OHRQoL is an important outcome that results from the interaction between oral health conditions, general health, individual, social and contextual factors. Several studies have highlighted the importance of assessing the characteristics of social life and the role of social deprivation on OHRQoL. However, most of these studies have a cross-sectional design, which limits cause-effect relationship. Considering that childhood characteristics may reflect throughout adult life, the purpose of this study is to evaluate the influence of neighborhood and individual social factors on children's OHRQoL. This cohort study assessed 639 children (1–5 years old) during a survey in 2010 in the city of Santa Maria, RS, Brazil. In the seven years follow-up, all subjects were again invited to participate in the study, and a total of 449 children (response rate of 70.3%) were re-evaluated. OHRQoL was assessed at follow-up through the Brazilian version of the Child Perception Questionnaire (CPQ 8-10). Exploratory variables were collected during the baseline and included: presence of class association, workers association and cultural community centers (contextual level); individual social networks; sociodemographic variables and oral health measures. Multilevel Poisson regression model was used to investigate the influence of individual and contextual characteristics on OHRQoL. The mean age of children evaluated at follow-up was 10 (standard deviation; 1.4) years. Children who lived in areas with class associations at baseline reported better OHRQoL at follow-up (IRR 0.82; 95 % CI 0.72-0.94). Regarding individual variables, female sex, low socioeconomic level, absence of parental involvement at school activities, attending a dentist by toothache and accentuated overjet were also associated with higher overall CPQ8-10 scores. The individual and neighborhood social capital influenced on OHRQoL. Children who lived in neighborhoods with higher social capital and whose parents had higher levels of individual social networks presented a better OHRQoL. This knowledge is important in the planning of public health policies to improve the health and well-being of children. It may give policy makers useful insights about the importance of community and social relations, helping to improve OHRQoL throughout life-course.

**Keywords:** Child. Longitudinal study. Oral Health. Quality of life. Social capital.

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## 1 INTRODUÇÃO

Durante os últimos anos tem ocorrido uma mudança global nos padrões de ocorrência e de distribuição das doenças bucais (WHO, 2003; SBBrasil, 2010; MARCENES et al., 2013; GIMENEZ et al., 2016), no entanto, elas ainda atingem cerca de 3,9 bilhões de pessoas mundialmente (MARCENES et al., 2013) e causam um alto impacto econômico (LIST et al., 2015). Além disso, também tem sido demonstrado que os índices mais altos de doenças bucais se concentram nos grupos com as piores condições socioeconômicas (PETERSEN, 2003; FREIRE et al., 2013; SCHWENDICKE et al., 2015), e essas disparidades têm surgido como um grande desafio para a saúde pública.

Mais recentemente, os estudos sobre as desigualdades em saúde bucal têm recebido uma nova perspectiva, onde são utilizados desfechos de saúde orientados para o paciente, como a autopercepção de saúde bucal e a qualidade de vida relacionada à saúde bucal (QVRSB) (TURREL et al., 2007; LAMARCA et al., 2014). Dessa forma, a QVRSB tem sido amplamente preconizada como um adjunto aos parâmetros clínicos no planejamento de políticas de saúde pública para a priorização de serviços e na avaliação de estratégias de saúde bucal (SISCHO; BRODER, 2011).

A qualidade de vida é considerada um parâmetro válido na avaliação do paciente em todas as áreas dos cuidados de saúde, e a saúde bucal e suas dimensões funcionais e psicológicas têm sido cada vez mais apontadas como uma parte integrante da saúde geral e do bem-estar dos indivíduos (SISCHO; BRODER, 2011; GLICK et al., 2016). Ela é influenciada de forma contínua pelos valores e atitudes das pessoas e das comunidades e reflete os atributos fisiológicos, sociais e psicológicos essenciais à qualidade de vida (GLICK et al., 2016).

Nesse contexto, a QVRSB é definida como um constructo multidimensional o qual se refere à extensão com que as desordens bucais interferem nas funções diárias e bem-estar dos indivíduos (BAKER, 2007; LOCKER; ALLEN, 2007). A avaliação subjetiva da QVRSB reflete o conforto das pessoas ao comer, dormir e se envolver em interações sociais, sua autoestima e sua satisfação com relação à sua saúde bucal (GROUP, 1995). Assim, QVRSB é um desfecho importante e que resulta da interação entre as condições de saúde bucal, saúde geral, fatores sociais e contextuais (LOCKER; ALLEN, 2007).

Diversos instrumentos têm sido desenvolvidos para mensurar a QVRSB, sendo em sua maioria questionários autoaplicáveis, também denominados de indicadores odontológicos ou sócio dentários (SLADE, 1997). Dentre esses instrumentos encontra-se o *Child Perceptions*

*Questionnaire* (CPQ8-10), o qual se mostrou válido para escolares com idade de 8 a 10 anos (JOKOVIC et al., 2004), entre 5 e 8 anos (FOSTER PAGE; BOYD; THOMSON, 2013), e, posteriormente, para o português brasileiro (BARBOSA; TURELI; GAVIÃO, 2009). Assim sendo, o CPQ8-10 demonstra ser um instrumento válido para crianças brasileiras com idade entre 5 a 10 anos.

Nos últimos anos, vários estudos têm explorado a relação entre preditores clínicos, socioeconômicos e QVRSB. Foi demonstrado que crianças que possuíam os piores índices e as condições mais precárias de saúde bucal, como cárie, gengivite e dor dentária, apresentaram uma pior autopercepção de saúde bucal e uma pior QVRSB (PIOVESAN et al., 2010; ORTIZ et al., 2014; TOMAZONI et al., 2014; CHAFFEE et al., 2017). O mesmo ocorre com crianças pertencentes a famílias de baixa renda (DE PAULA et al., 2013; GUEDES et al., 2014; KUMAR; KROON; LALLOO, 2015).

Já está bem estabelecido que indivíduos pertencentes a classes socioeconômicas mais baixas são mais susceptíveis a serem expostos a diversos fatores de risco que afetam a saúde oral (NEWTON; BOWER, 2005, TURRELL, 2007; FREIRE, 2013), entretanto, a busca pelos processos biológicos envolvidos na conexão entre saúde bucal e estrutura social levou a um foco nos indivíduos e não na sociedade em que vivem (BRUNNER; MARMOT, 1999). Há necessidade de examinar as características da vida social, que embora impactem na saúde bucal dos indivíduos, não são redutíveis a esses (SCHOU, 1991; SISSON, 2007).

Alguns modelos teóricos foram desenvolvidos com o intuito de melhor descrever a relação existente entre diferentes fatores - individuais e contextuais - e saúde (DAHLGREN; WHITEHEAD, 1991; CSDH, 2007). O modelo proposto por Dalgren e Whithead (1991), por exemplo, sugere a existência de uma rede de relações entre fatores em diferentes estratos ou níveis, demonstrando que os fatores individuais são influenciados pelas redes sociais e estas por condições socioeconômicas, culturais e ambientais nas quais os indivíduos estão inseridos (DAHLGREN; WHITEHEAD, 1991). Outro modelo é o proposto pela Comissão dos Determinantes Sociais de Saúde (2007), o qual se destaca por incluir características relacionadas ao contexto político e socioeconômico em que as pessoas vivem, além da inclusão de um componente transversal que representa o capital social e a coesão social (CSDH, 2007).

Posteriormente, o estudo de Sicho e Broder (2011) sugere um modelo teórico específico para o QVRSB, o qual incorpora fatores biológicos, sociais, psicológicos e culturais (SICHO; BRODER, 2011). Este modelo, adaptado de Wilson e Cleary (1995) (WILSON; CLEARY, 1995) foi construído baseado na teoria da ciência psicológica e social e

em achados epidemiológicos (PATRICK; ERIKSON, 1993; BARBOSA; GAVIAO, 2008), ligando variáveis clínicas, status funcional, aparência oral-facial, status psicológico, QVRSB e qualidade de vida geral. O modelo reconhece também os efeitos de fatores ambientais ou contextuais, como por exemplo os fatores socioculturais, a educação e a estrutura familiar (SICHO; BRODER, 2011).

Os modelos conceituais demonstram que as doenças não ocorrem como um fenômeno isolado, e sim, como uma característica das pessoas e do seu ambiente (SCHOU, 1991; SISSON, 2007), que não se refere apenas ao lar ou a escola, mas também ao contexto circundante, como por exemplo, o bairro (DIEZ-ROUX; MAIR, 2010). Evidências sugerem que o ambiente social compartilhado em nível de bairro exerce um efeito significativo na saúde e na qualidade de vida das pessoas que lá habitam, independentemente do seu nível de risco individual (COLEMAN, 1988; DIEZ-ROUX et al., 2001; KALFF et al., 2001). O ambiente social é a composição socioeconômica da população residente e os aspectos sociais e estruturais dos bairros, como o apoio comunitário, coesão coletiva e capital social (JACKSON, 2003). O capital social tem sido definido como as características da estrutura social (como por exemplo a participação cívica, níveis de confiança e reciprocidade) que atuam como recursos acessados pelos indivíduos e que podem facilitar as ações coletivas (COLEMAN, 1988; PUTNAM, 1993; PUTNAM, 1995).

Nesse contexto, o capital social pode ser entendido como um recurso acessível às pessoas por meio da participação em vários tipos de redes sociais, possibilitando o alcance de certos objetivos, retornos ou benefícios que não seriam alcançados na ausência deste capital característico (BORDIEU, 1986; COLEMAN, 1988; PUTNAM, 1995; ROSTILA, 2011). Estudos anteriores demonstraram que a rede social em que o indivíduo está inserido fornece capital social, e esse está diretamente relacionado a autopercepção de saúde, uma vez que os bons comportamentos em saúde estão associados a boas redes sociais (AIDA et al., 2008; AIDA et al., 2011). Além disso, tem sido demonstrado que a presença de centros comunitários na comunidade proporciona um maior envolvimento dos indivíduos em atividades sociais, o que aumenta a coesão social e o nível de confiança no bairro (AIDA et al., 2008). Portanto, a probabilidade de adoção de um determinado comportamento pode depender do grau em que esse comportamento já foi aderido na comunidade (DIEZ-ROUX, 2000; DIEZ-ROUX; MAIR, 2010).

Os bairros socialmente desfavorecidos tendem a acumular um menor estoque de capital social (DRUKKER et al., 2003; TURREL et al., 2007). Consequentemente, os indivíduos que residem nesses locais são os que apresentam os piores níveis de doenças

bucais e os maiores impactos na QVRSB (AIDA et al., 2008; AIDA et al., 2011; GUEDES et al., 2014). Dessa forma, é demonstrado que a quantidade e qualidade de redes sociais na vida dos indivíduos e influenciam em desfechos subjetivos de saúde bucal (GUPTA et al., 2015).

A relação entre as características da vida social, autopercepção de saúde bucal e QVRSB já vem sendo pesquisada (TURREL et al., 2007; GUEDES et al., 2014; LAMARCA et al., 2014; SOUZA et al., 2016; VETTORE; AQUEELI, 2016). Entretanto, grande parte dos estudos acima citados são de cunho transversal, que embora sejam importantes para evidenciar o perfil associativo, não permitem o estabelecimento de causalidade entre as variáveis (NEWTON; BOWER, 2005). Além disso, não são apenas as condições sociais atuais que apresentam importância à saúde, mas também as circunstâncias ao longo da vida (DIEZ-ROUX; MAIR, 2010; HOLST; SCHULLER, 2012). Nesse contexto, ainda há a necessidade de mais estudos para elucidar e compreender de uma forma mais profunda a influência dos determinantes sociais contextuais na QVRSB. Além disso, pesquisadores já ressaltaram que identificar um fator causal conhecido sem levar em conta os caminhos sociais os quais se relacionam com esse fator pode ser ineficaz (NEWTON; BOWER, 2005).

Através de um estudo longitudinal se faz possível avaliar o efeito cumulativo de exposições ao longo do tempo (HORTA; WEHRMEISTER, 2017), como por exemplo, o baixo nível socioeconômico ou o baixo capital social. Estudar esses fatores em uma população infantil é de extrema importância, pois quanto mais tempo a criança vive em condições de privação social, maior a probabilidade de ela ter resultados de saúde adversos, além do fato de que esses problemas e as suas consequências não se refletem apenas na infância, mas podem persistir ao longo da vida (HOLST; SCHULLER, 2012).

Compreender as inter-relações da rede de vizinhança na qualidade de vida percebida pelas crianças pode fornecer aos decisores políticos informações úteis sobre a importância da comunidade, do tecido social e das relações sociais no nível individual e comunitário. Dessa maneira, pode-se contribuir para o planejamento de programas de saúde bucal socialmente apropriados, a fim de melhorar a saúde bucal das populações e reduzir as desigualdades e o impacto dessas condições na QVRSB. Assim, o objetivo do estudo foi avaliar a influência de fatores sociais individuais e comunitários na QVRSB de crianças.



**2 ARTIGO – THE ROLE OF NEIGHBORHOOD AND INDIVIDUAL SOCIAL CAPITAL IN EARLY CHILDHOOD ON ORAL HEALTH RELATED QUALITY OF LIFE: A 7-YEAR COHORT STUDY**

Este artigo será submetido ao periódico *Quality of Life Research*, ISSN: 0962-9343, Fator de impacto = 2.344; Qualis A2. As normas para publicação estão descritas no Anexo C.

**Title page****The role of neighborhood and individual social capital in early childhood on oral health related quality of life: a 7-year cohort study****Authors:**

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**Compliance with Ethical Standards**

**Conflicts of interest:** The authors declare that they have no conflict of interest.

**Ethical approval:** All procedures performed in studies involving human participants were in accordance with the ethical standards of the Human Research Ethics Committee of the Federal University of Santa Maria (protocol number 54257216.1.0000.5346), Brazil.

**Informed consent:** Informed consent was obtained from all individual participants included in the study.

**Abstract**

*Purpose:* Social capital incorporates neighborhood and individual levels of interactions and influences health. The aim of this study were to assess the influence of neighborhood and individual social capital in oral health-related quality of life (OHRQoL) of children.

*Methods:* This 7 years cohort study was designed with 639 children (1–5 years old) who had been examined during a survey in 2010. OHRQoL was assessed in follow-up through the Brazilian version of the Child Perception Questionnaire (CPQ 8-10). Exploratory variables were collected during the baseline and included: presence of social class association, workers association and cultural community centers (contextual level); individual social networks; sociodemographic variables and oral health measures. A multilevel Poisson regression model was used to investigate the influence of individual and contextual characteristics on OHRQoL.

*Results:* From 639 preschoolers examined at baseline, a total of 449 children were re-evaluated at 7-year follow up (a 70.3% response rate). Children who lived in areas with the presence of social class associations in baseline reported better OHRQoL in follow-up (IRR 0.82; 95% CI 0.72-0.94). Regarding individual variables, low socioeconomic status and poor individual social networks were also associated with higher overall CPQ8-10 scores.

*Conclusions:* High levels of individual and neighborhood social capital in early childhood influenced positively the child OHRQoL. This knowledge is important in planning public health policies to improve the health and well-being of children and it may give policy makers useful insights into the importance of community and the social relations, aimed at improving OHRQoL throughout life-course.

**Keywords:** Children. Cohort Study. Epidemiology. Quality of Life. Social Capital.

## Introduction

Motivated by a broader conception of the health and disease process, studies on the inequalities in oral health have received a new perspective, where health outcomes are patient oriented, such as oral health related quality of life (OHRQoL) [1, 2]. In this context, the OHRQoL has been widely advocated as an adjunct to clinical parameters in planning public health policies and in evaluating of oral health strategies [3]. The OHRQoL is described as a multidimensional construct and refers to the impact of oral health conditions on the daily functions and well-being of individuals [4]. Thus, the OHRQoL is an important outcome that results from an interaction between oral health conditions, general health, social and contextual factors [4].

In this sense, has been suggested that a broad range of social determinants influence oral health and OHRQoL [3, 5]. Among these factors is social capital, which is considered a social determinant of important influence on health [6]. Social capital comprises social resources that evolve in accessible social networks and social structures characterized by mutual trust [7-10]. These social resources facilitate access to various returns, which might benefit both the individual and the collective [9, 10]. In this context, social capital can be understood as a resource accessible to people through participation in various types of social networks, allowing the achievement of certain objectives, returns or benefits that would not be achieved in the absence of this characteristic capital [7-10].

Previous studies have evaluated on the relationship between contextual and social factors, self-perception oral health and OHRQoL in different age groups [1, 11-14]. According these findings, it was demonstrated that the social network into which the individual is inserted provides social support, and this is related to self-reported health status, since health behavior is associated with good social networks [11, 12, 15]. Moreover, individuals residing in neighborhoods with low social capital are those the worst levels of oral diseases and the greatest impacts on OHRQoL [11, 12]. Despite these evidences, most of the studies have a cross-sectional design, that prevents hypotheses of causality. In this context, there is still a need for more specific studies to understand more deeply the influence of contextual and social determinants and their cumulative effect on OHRQoL.

Longitudinal studies addressing the cumulative effect of low socioeconomic conditions and social capital over the childhood are important for the implementation of oral health promotion strategies, because these problems and their consequences do not reflect only in childhood, but may persist throughout life [16]. The aim of this study was to assess the influence of neighborhood and individual social factors in children OHRQoL.

We hypothesized that children who lived in neighborhoods with high social capital and whose parents had high levels of individual social networks are more likely to report high OHRQoL.

## **Methods**

This study is reported according to STROBE (Strengthening the Reporting of Observational Studies in Epidemiology) guidelines.

### *Study Design and Participants*

This is a cohort study with 7 years of follow-up. The first cohort's assessment was undertaken in 2010 in Santa Maria, a southern city in Brazil. In 2010, the city had an estimated population of 263,403, which includes 27,520 children under 6 years old. A sample group was selected from all children attended health centers in the municipality in the National Children's Vaccination Day. The sampling points were 15 health centers randomly selected in different neighborhoods of the city and each health center is responsible for vaccinating children living in that area. A total of 639 children aged 1–5 years were examined for the assessment of their oral health status. At this survey, caregivers answered a semi-structured questionnaire regarding sociodemographic characteristics and social networks. Full details about the methodology used of the epidemiological survey were published elsewhere [17].

For the sample size calculation we considered a standard error of 5%, 95% confidence level and taking a prevalence 56.1% of children with high mean CPQ8–10 scores in the exposed group (high vulnerability) and 38.8% in the unexposed group (low vulnerability) [18]. The ratio of unexposed to exposed was 2:1, a design effect of 1.2, a statistical power of 80%. Considering possible losses, 30% was added to the sample size, the minimum sample size required was 472 children. As this study was part of a large survey that investigated other outcomes, a sample larger than the necessary was included.

### *Follow-up assessment*

After 7 years, all children who participated in the epidemiological survey were invited to participate. During the follow-up survey, children answered a questionnaire to evaluate OHRQoL. Data on demographic, socioeconomic variables and oral health measures were also obtained. Data collection was carried out from January of 2017 to March 2018. Some search strategies were adopted in order to trace the greatest possible number of children in this follow-up. First, these children were accessed through telephone calls to parents for

update the data and schedule the child evaluation. In addition, some children were located through the acquisition of student listings enrolled in the city's public schools. After updating addresses and authorizing the caregivers, the children were evaluated in their schools and residences.

#### *Oral health related quality of life*

The Brazilian version of the Child Perception Questionnaire (CPQ8-10) was used to assess the children OHRQoL - the outcome of this study [19, 20]. Children answered the questionnaire in the follow-up through a face-to-face interview conducted by previously trained interviewers. The CPQ8-10 comprises 25 questions organized into 4 domains: oral symptoms (5 questions), functional limitations (5 questions), emotional well-being (5 questions) and social well-being (10 questions). Answers were collected on a 5-point Likert scale, scored from 0 to 4. The mean CPQ 8–10 scores were calculated by overall scores ranging from 0 to 100. Higher overall scores indicating poorer OHRQoL.

#### *Neighborhood and individual social capital*

The independent variables were social support and social networks and were obtained at baseline. Individual social capital was assessed by the levels of social networks from parents using the two questions: "In the past 12 months, have you attended a volunteer group?" and "Do you participate in any group related to your child's school activities?" and the following possible responses: 0 = no and 1 = yes. These questions were answered for caregivers through face-to-face interviews by trained interviewers. These are a commonly used indicators in the social capital literature and in the Brazilian population [2, 11]. In this context, it has demonstrated that social relationships surrounding the individual, as well as or groups of people they have contact with or with some form of participation, can be considered as a proxy of social capital [21].

The neighborhood social capital was defined by geographic area through the neighborhood in which the child was living, in order to assess the contextual-level influences in OHRQoL. Three community-related variables were obtained: the presence of social class association, workers association and cultural community centers. These covariates have previously been used as proxies for a community social network [15] and are theoretically related to social capital and social cohesion, resulting in positive or negative impacts within a collective environment, independent of individual social networks [22, 23]. The total number of social class associations, workers associations and cultural community centers and were counted within each of 15 neighborhoods. These context-indicating variables were dichotomized in present/absent for analysis. This

information was obtained from the local government (municipal official publication) and has been used in official city publications.

### *Covariates*

Some potential confounders of the association were collected during the baseline and included: gender (male or female), maternal education, household income, household crowding, dental attendance and oral health measures (overjet). Maternal education was collected in years of study and dichotomized in 8 years or more of schooling or <8 years of schooling (incomplete primary education). Household income was a sum of all forms of income in month (salary, wages, pensions, cash transfer program and rental income). It was collected in Reais (Brazilian cure - R\$3.75 it was equivalent to U\$1.00 approximately) and transformed in quartiles for each assessment: Q1 (Lowest): < R\$500,00, Q2: R\$500,00 to < R\$900,00, Q3: R\$900,00 to < R\$1,500.00; and Q4 (Highest): R\$1,500+. Household crowding were evaluated through the ratio number of people per room in house (except bathroom) and transformed in quartiles for analysis. Children were also classified according to their use of dental service in the previous 6 months as: (0) visited the dentist for routine or check-up, (1) visited the dentist for toothache and, (2) not visited the dentist. These data were collected through a semi-structured questionnaire answered for parents or guardians in the baseline assessment.

Clinical variables were assessed at baseline by calibrated examiners and International criteria standardized by the World Health Organization for oral health surveys was used for all dental examinations [24]. Oral health measures were performed on health centers in dental chairs with conventional illumination, using a plane dental mirror and periodontal probes (CPI; “ball point”). For the survey, 15 examiners selected after the training and calibration procedures conducted the assessments. The maxillary overjet was evaluated in millimeters and dichotomized in present ( $\geq 3$  mm) and absent ( $< 3$  mm).

### *Statistical Analyses*

Data analysis was performed with STATA 14 (StataCorp. 2014. Stata Statistical Software: Release 14.1. College Station, TX: StataCorp LP). The differences between participants with the non-participants were evaluated through the chi-square test. The OHRQoL overall scores was the main dependent variable. Descriptive analysis described individual and contextual characteristics of the sample in the baseline (T1) and follow-up (T2). The variation of overall CPQ8-10 scores at follow-up according to characteristics at baseline was also estimated.



Adjusted multilevel Poisson regression models were used to assess the association between neighborhood and individual social capital and OHRQoL. The multilevel structure of analysis considered individuals (level 1) nested into 15 neighborhoods (level 2). Multilevel models provide the estimation of contextual effects of neighborhood-level variables by accounting for spatial clustering of individuals within areas [25]. The multilevel model used the scheme of fixed effect with random intercept. The results are presented as incidence rate ratio (IRR) and its respective 95% confidence interval (95% CI).

Our statistical models were tested according to a theoretical model presented in Figure 1. Three models were described. Model 1 (“empty model”), an unconditional model estimated the proportion of variance for each level before the incremental introduction of the contextual and individual independent variables; Model 2 (“contextual”) included contextual variables; Model 3 (“full”) was composed for Model 2 plus individual sociodemographic variables and clinical oral health measures. Variables with P-value <0.20 in the unadjusted analysis were considered for the multivariable models. In all models, the quality of fit was measured using deviance (-2log likelihood) and the Median Incidence Rate Ratio (MIRR); statistically significant changes in the fitting of the models were assessed using the likelihood ratio.

### *Ethical Issues*

This cohort study was approved by the Committee for Ethics in Research of School of Dentistry, Federal University of Santa Maria (protocol number 54257216.1.0000.5346) and the parents’ participants signed a consent form.

### **Results**

From 639 preschoolers assessed at baseline, a total of 449 children were re-evaluated at 7-year follow up (a 70.3% response rate). The mean age of children evaluated at baseline and follow-up was 2.8 (standard deviation; 1.4) and 10.0 (standard deviation; 1.4) years, respectively. The reasons for follow-up losses included refusal to take part in the study (n=9) and inability to find the children (n=181). Comparing the participants with the non-participants, there were no statistical differences for sex (P=0.28), age (P=0.18) and maternal education (P=0.35). The re-examined children had significantly lower income than the nonparticipants (P <0.05), however, we performed sensitivity analysis using the Monte Carlo simulation and verified that this difference did not influence our results.

Distributions of individual and contextual characteristics of the sample are presented in Table 1. We observed that 49,6% and 51% of the individuals were girls at baseline and follow-up, respectively. In relation to household income, most of the participants were in the lower quartiles in the two assessments. Regarding to maternal education, most mothers had more than 8 years of schooling.

Table 2 presents the distribution of overall CPQ8-10 scores at follow-up according to individual and contextual characteristics at baseline. Children with higher overall CPQ8-10 scores were girls, had worse socioeconomic level and had visited the dentist for toothache. Moreover, children's whose parents were member of volunteer networks and were involved at school activities reported a better OHRQoL. The presence of social class associations and workers associations and in the neighborhood were related to lower scores in CPQ8-10.

Unadjusted association between contextual and individual variables and overall CPQ8-10 scores are showed in Table 3. There were statistically significant differences of individual and neighborhood (social class association) social capital variables and CPQ8-10 scores. Furthermore, the overall CPQ8-10 scores were statistically higher among quartiles of low-household income, household crowding and with lower maternal education. The presence of accentuated overjet was also associated with poor OHRQoL.

Table 4 shows the results of adjusted multilevel Poisson regression analyses. In final model (Model 3), sex (girls), low-household income, high-household crowdin, dental attendance (toothache or not visited) and presence of accentuated overjet at baseline were associated with higher overall CPQ8-10 in follow-up. In relation to the individual social capital, children whose parents were not involved at school activities presented worse OHRQoL (IRR 1.28; 95% CI 1.19-1.39). The influence of neighborhood social capital covariates could be noted at the contextual level, as those who lived in areas with social class associations in baseline reported better OHRQoL in follow-up (IRR 0.82; 95 % CI 0.72-0.94).

## **Discussion**

The present findings support the hypothesis that individual and neighborhood social capital in early childhood influence the OHRQoL throughout the childhood. Children who lived in areas with social class associations and whose parents not were involved at school activities reported better OHRQoL in follow-up. Our results also suggest that female sex, lower socioeconomic status, attending a dentist by toothache and accentuated overjet are related to poor OHRQoL in children. Recent studies have reported that psychosocial factors are related to the children's OHRQoL, however, the individual and contextual effects of social capital on children's OHRQoL longitudinally was not explored yet.

The presence of social class associations in neighborhood influenced positively children's OHRQoL. The presence of social class associations has been described as an indicator as a proxy for the degree of social networks, being theoretically related to social capital and social cohesion [23]. A high social capital community is characterized by the existence of associations and active citizens, leads to a positive social environment which is characterized by trust and social cohesion among individuals [22](Putman 2000). It has been suggested that living in a high social capital neighborhood can be beneficial even for individuals with poor social connections [22]. In this sense, collective social capital can influence health by psychosocial processes, behaviors pathways, access to health services and development of supportive public policy [26].

Communities with a high degree of cohesion are hypothesized to experience lower levels of psychosocial stress through access to social support, as well as via feelings of safety, belonging and coping [26, 27]. Moreover, these communities are more successful in uniting for the best interest of the neighborhood and influencing political decisions in health, might be better able to lobby for access to high-quality health and social services [28]. Besides that, high levels of social capital in local communities can influence health through the spread of healthy norms and are most likely to support health-enhancing behaviors [28]. Thus, it is demonstrated that social network into which the individual is inserted provides social support, and this is related to self-reported health status, since health behavior is associated with good social networks [11, 15].

In relation to the individual social capital, our results showed that children whose parents were not involved at school activities reported worse OHRQoL. In this study, the level of social networks was used as a proxy of individual social capital. Possible explanations for our findings is that social relationships surrounding the individual or some form of participation in groups provides various forms of social support that may influence health by functioning as 'buffering factors' for stress, as well as via feelings of coherence and meaningfulness [28, 29]. Moreover, individuals in a social network are subject the influence normative dental health behaviors and also can access to material resources and services, such as job opportunities and health [26, 28].

Furthermore, social networks are distinguished into "horizontal" egalitarian relationships and "vertical" hierarchical relationships [9, 30]. Horizontal networks are considerate the capital that refers to cooperative and trusting relations between members of a network who see themselves as similar ("bonding") or that they are not alike in some socio-demographic or social identity ("bridging") [30]. The vertical or linking social capital consists of vertical ties between people in different formal or institutionalized power hierarchies [30]. In this context, the parental involvement at school activities can be considered a type of vertical social capital, showing

the relationship between school-institution and parents-children. The importance of linking social capital is that the nature and extent of respectful and trusting ties to representatives of formal institutions that has a major impact on people's welfare and health [10]. Studies in the education literature have demonstrated positive effects of parental involvement on academic outcomes [31]. Thus, greater parental involvement in schools can be linked to promote the health and well-being of children, as well as their subjective perceptions.

Our findings demonstrated that low household income and household crowding impacted negatively the children OHRQoL in accordance with previous studies [12, 32-34]. We considered household income and household crowding as proxies to individual socioeconomic status [35]. A possible explanation for this is that individuals with poor socioeconomic status are more susceptible to general and oral health risk factors, which may generate negative impacts on the functional, psychological and social dimensions of quality of life [1, 4, 36]. Moreover, socioeconomic barriers are related with a decreased searching of services, and the combination of perceived need for treatment and absence of resources for searching health professionals can influence the healthy habits and coping behavior, generating discontent and discomfort [37-39].

Clinical oral health measures were also associated with OHRQoL in children. Children with accentuated overjet, who did not visited a dentist or visited by toothache had worse OHRQoL. Similar to our results, studies have shown that unaesthetic occlusal traits may induce unfavorable social responses among children, impairing the social interaction and psychological well-being of the individuals, which reflects in OHRQoL [40, 41]. Children who reporting toothache visited a dentist with higher frequency than who sought the dentist for preventive reasons [42]. Moreover, toothache affect the physical status of the children, as well as their psychological well-being and social interactions, negatively affecting the OHRQoL [43].

The main limitations this study that social capital was measured by indirect indicators of social cohesion, social networks and social support, which may not provide a full view of social capital. However, both theory and measurement of social capital are still evolving and inconsistencies have been reported in its definition and measurement, have been a source of discussion [28]. Notwithstanding, we used the same social capital indicators described in previous studies [11, 15]. Furthermore, introduction of new concepts in science often gives rise to resistance and criticism [10].

This study also has strengths. It is a long-term cohort study with a large cohort retention rate of 70.3% after 7 years, indicating the extern validity of our findings. In addition, this study is the longitudinally assessment the influence of psychosocial factors in OHRQoL in a transition stage in children's live, which provides evidence

for the development of broad oral health promotion at this age group aimed at improving OHRQoL throughout life-course.

### Conclusion

Our findings indicated that individual and neighborhood social capital influenced the OHRQoL. Children of poor socioeconomic status, low individual and neighborhoods social capital have a worse OHRQoL. This knowledge is important in planning public health policies to improve the health and well-being of children and it may give policy makers useful insights into the importance of community, the social relations at the individual, community and societal level, aimed at reducing inequality on OHRQoL.

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## Tables

**Table 1** Contextual and individual characteristics of the participants at the baseline (T1) and at 7-year follow-up (T2)

Variables	Baseline (T1) <sup>a</sup>	Follow-up (T2) <sup>b</sup>
	(n= 639)	(n= 449)
	n (%)	n (%)
<i>Contextual-level variables</i>		
Social class association		
Absent	393 (61.6)	277 (61.7)
Present	245 (38.4)	172 (38.3)
Workers association		
Absent	413 (64.7)	284 (63.3)
Present	225 (35.3)	165 (36.7)
Cultural community centers		
Absent	365 (57.2)	265 (59.0)
Present	273 (42.8)	184 (41.0)
<i>Individual-level variables</i>		
Sex		
Boys	322 (50.4)	220 (49.0)
Girls	317 (49.6)	229 (51.0)
Maternal education		
≥ 8 years of formal education	357 (56.5)	246 (55.3)
< 8 years of forma education	275 (43.5)	199 (44.7)
Household income in R\$ <sup>c</sup>		
Lowest (1 <sup>st</sup> quartile)	137 (22.8)	94 (22.1)
Medium lowest (2 <sup>nd</sup> quartile)	172 (28.6)	129 (30.3)
Medium highest (3 <sup>rd</sup> quartile)	170 (28.2)	128 (30.1)
Highest (4 <sup>th</sup> quartile)	123 (20.4)	75 (17.6)
Household crowding in people/room		
Lowest (1 <sup>st</sup> quartile)	221 (35.0)	147 (33.0)
Medium lowest (2 <sup>nd</sup> quartile)	214 (33.9)	158 (35.4)
Medium highest (3 <sup>rd</sup> quartile)	53 (8.4)	34 (7.6)
Highest (4 <sup>th</sup> quartile)	143 (22.7)	107 (24.0)
Dental attendance		
Check-up/routine	94 (14.9)	63 (14.2)
Toothache	40 (6.35)	30 (6.8)
No visit	496 (78.7)	349 (79.0)
Member of volunteer networks		
Yes	97 (15.3)	74 (16.6)
No	538 (84.7)	372 (83.4)
Parental involvement at school activities		
Yes	248 (39.3)	178 (40.1)
No	383 (60.7)	266 (59.9)
Maxillary overjet		
≤ 3mm	405 (86.5)	292 (87.7)
> 3mm	63 (13.5)	41 (12.3)

<sup>a</sup>T1, baseline.

<sup>b</sup>T2, 7-year follow-up.

<sup>c</sup>R\$, Real (R\$3.75 it was equivalent to US\$1.00 approximately).

**Table 2** Sample distribution of overall CPQ8-10 scores according to individual and contextual characteristics at baseline

Variables	CPQ8-10 Follow-up (T2) <sup>a</sup>
	Mean (SD) <sup>b</sup>
<i>Contextual-level variables</i>	
Social class association	
Absent	11.9 (11.8)
Present	8.4 (7.0)
Workers association	
Absent	11.5 (11.2)
Present	9.0 (8.5)
Cultural community centers	
Absent	10.5 (10.0)
Present	10.6 (10.8)
<i>Individual-level variables</i>	
Sex	
Boys	10.0 (10.2)
Girls	11.1 (10.5)
Maternal education	
≥ 8 years of formal education	9.4 (9.3)
< 8 years of formal education	11.8 (11.1)
Household income in R\$ <sup>c</sup>	
Lowest (1 <sup>st</sup> quartile)	13.3 (13.8)
Medium lowest (2 <sup>nd</sup> quartile)	10.6 (10.8)
Medium highest (3 <sup>rd</sup> quartile)	8.8 (7.6)
Highest (4 <sup>th</sup> quartile)	8.3 (7.2)
Household crowding in people/room	
Lowest (1 <sup>st</sup> quartile)	9.0 (9.2)
Medium lowest (2 <sup>nd</sup> quartile)	11.2 (10.7)
Medium highest (3 <sup>rd</sup> quartile)	12.6 (15.1)
Highest (4 <sup>th</sup> quartile)	11.2 (9.5)
Dental attendance	
Check-up/routine	8.7 (8.4)
Toothache	11.9 (10.2)
No visit	10.9 (10.7)
Member of volunteer networks	
Yes	9.9 (9.5)
No	10.7 (10.6)
Parental involvement at school activities	
Yes	9.2 (9.3)
No	11.5 (11.0)
Maxillary overjet	
≤ 3mm	10.6 (10.5)
> 3mm	12.4 (13.5)

<sup>a</sup>T2, 7-year follow-up.<sup>b</sup>SD, standard deviation.<sup>c</sup>R\$, Real (R\$3.75 it was equivalent to US\$1.00 approximately).

**Table 3** Unadjusted association between contextual and individual variables at baseline (T1) and overall CPQ8-10 scores at 7-year follow-up (T2), determined using multilevel Poisson regression

<b>Variables</b>	<b>IRR<sup>a</sup> (95% CI)<sup>b</sup></b>	<b>P-value</b>
<i>Contextual variables (neighborhood)</i>		
Social class association		P<0.01
Absent	1	
Present	0.72 (0.59-0.89)	
Workers association		P=0.10
Absent	1	
Present	0.81 (0.63-1.03)	
Cultural community centers		P=0.90
Absent	1	
Present	0.98 (0.75-1.28)	
<i>Individual variables (child)</i>		
Sex		P<0.01
Boys	1	
Girls	1.08 (1.02-1.14)	
Maternal education		P<0.001
≥ 8 years of formal education	1	
< 8 years of formal education	1.18 (1.11-1.25)	
Household income in R\$ <sup>c</sup>		P<0.001
Lowest (1 <sup>st</sup> quartile)	1	
Medium lowest (2 <sup>nd</sup> quartile)	0.75 (0.69-0.81)	
Medium highest (3 <sup>rd</sup> quartile)	0.65 (0.60-0.71)	
Highest (4 <sup>th</sup> quartile)	0.62 (0.56-0.68)	
Household crowding in people/room		P<0.001
Lowest (1 <sup>st</sup> quartile)	1	
Medium lowest (2 <sup>nd</sup> quartile)	1.19 (1.11-1.28)	
Medium highest (3 <sup>rd</sup> quartile)	1.31 (1.17-1.46)	
Highest (4 <sup>th</sup> quartile)	1.17 (1.08-1.28)	
Dental attendance		P<0.001
Check-up/routine	1	
Toothache	1.26 (1.10-1.45)	
No visit	1.21 (1.10-1.32)	
Member of volunteer networks		P<0.01
Yes	1	
No	1.14 (1.05-1.23)	
Parental involvement at school activities		P<0.001
Yes	1	
No	1.26 (1.18-1.34)	
Maxillary overjet		P<0.01
≤ 3mm	1	
> 3mm	1.15 (1.04-1.27)	

<sup>a</sup>IRR, incidence rate ratio.<sup>b</sup>CI, confidence interval.<sup>c</sup>R\$, Real (R\$3.75 it was equivalent to US\$1.00 approximately).

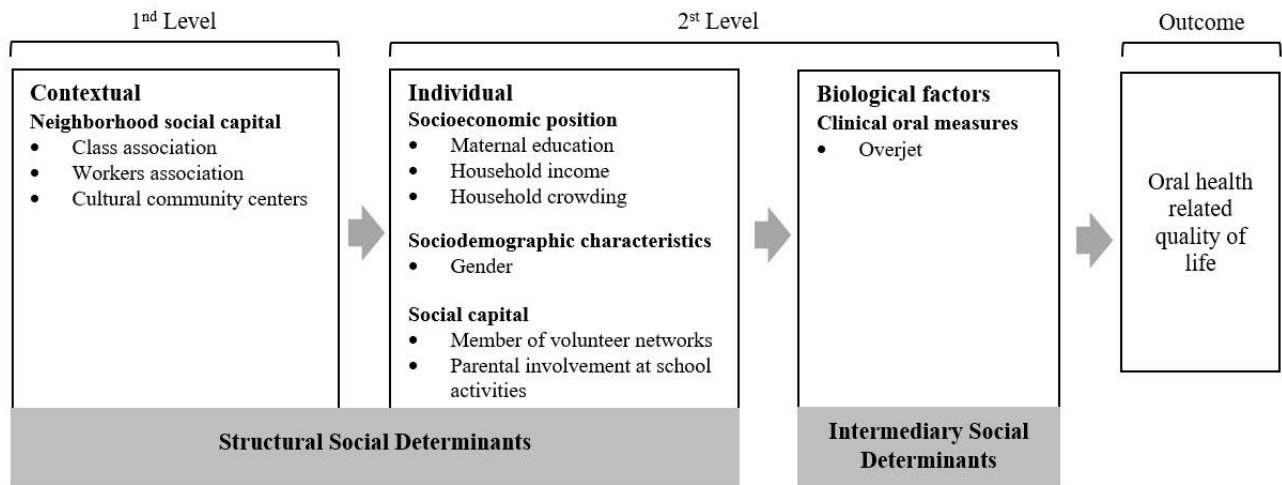
**Table 4** Adjusted association of contextual and individual variables at baseline (T1) with overall CPQ8-10 scores at 7-year follow-up (T2), determined using multilevel Poisson regression

Variables	Model 1 <sup>a</sup> ("empty")	Model 2 <sup>b</sup> ("contextual")	Model 3 <sup>c</sup> ("full")
	IRR <sup>d</sup> (95% CI) <sup>e</sup>	IRR (95% CI)	IRR (95% CI)
<b>Fixed component</b>			
Intercept	9.82 (8.63-11.18)	11.95 (10.31-13.84)	7.90 (6.35-9.83)
<i>Contextual variables (neighborhood)</i>			
Social class association			
Absent		1	1
Present		0.71 (0.59-0.86)**	0.82 (0.72-0.94)**
Workers association			
Absent		1	1
Present		0.83 (0.69-1.00)	0.81 (0.71-0.93)
Cultural community centers			
Absent		1	1
Present		1.07 (0.88-1.29)	1.14 (1.00-1.31)
<i>Individual variables (child)</i>			
Sex			
Boys			1
Girls			1.09 (1.02-1.17)*
Maternal education			
≥ 8 years of formal education			1
< 8 years of formal education			0.95 (0.88-1.03)
Household income in R\$ <sup>f</sup>			
Lowest (1 <sup>st</sup> quartile)			1
Medium lowest (2 <sup>nd</sup> quartile)			0.81 (0.73-0.89)***
Medium highest (3 <sup>rd</sup> quartile)			0.64 (0.58-0.72)***
Highest (4 <sup>th</sup> quartile)			0.70 (0.61-0.80)***
Household crowding in people/room			
Lowest (1 <sup>st</sup> quartile)			1
Medium lowest (2 <sup>nd</sup> quartile)			1.20 (1.10-1.32)***
Medium highest (3 <sup>rd</sup> quartile)			1.30 (1.13-1.50)***
Highest (4 <sup>th</sup> quartile)			1.09 (0.99-1.21)
Dental attendance			
Check-up/routine			1
Toothache			1.46 (1.22-1.75)***
No visit			1.24 (1.09-1.40)**
Member of volunteer networks			
Yes			1
No			1.10 (0.99-1.22)
Parental involvement at school activities			
Yes			1
No			1.28 (1.19-1.39)***
Maxillary overjet			
≤ 3mm			1
> 3mm			1.27 (1.14-1.40)***
<b>Random component</b>			
Deviance = (-2 loglikelihood)	5085.58	5074.38	3463.42
MIRR <sup>g</sup>	1.27	1.17	1.10

\*P-value &lt;0.05; \*\*P-value &lt;0.01; \*\*\*P value &lt;0.001.

<sup>a</sup>Model 1: empty model, represents unconditional model.<sup>b</sup>Model 2: mutually adjusted for contextual variables.<sup>c</sup>Model 3: fully adjusted for contextual, individual and oral health variables.<sup>d</sup>IRR, incidence rate ratio; <sup>e</sup>CI, confidence interval;<sup>f</sup>R\$, Real (R\$3.75 it was equivalent to US\$1.00 approximately).<sup>g</sup>MIRR, median incidence rate ratio.

**Figure 1** Theoretical model for the study of contextual and individual determinants of OHRQoL in children, adapted from WHO [44].



### 3 CONSIDERAÇÕES FINAIS

O presente estudo avaliou a influência do capital social individual e comunitário na primeira infância na qualidade de vida relacionada à saúde bucal de crianças (QVRSB). Para isso, foi realizado um estudo de acompanhamento com crianças de 1 a 5 anos de idade durante um período médio de 7 anos. Estudos longitudinais que abordam o efeito cumulativo da privação social nessa faixa etária são importantes para a implementação de estratégias de promoção da saúde bucal, pois a privação social e as suas consequências não refletem apenas na infância, mas podem persistir ao longo da vida.

O capital social exerceu influência na QVRSB das crianças tanto em nível individual como contextual. Crianças que viviam em bairros com alto capital social e cujos pais possuíam altos níveis de redes sociais individuais relataram melhor QVRSB no acompanhamento. Estes achados justificariam iniciativas políticas que levem em consideração importância da comunidade, das relações sociais no nível individual, comunitário e social, visando reduzir a desigualdade na QVRSB de crianças.

O capital social foi medido por indicadores indiretos de coesão social, redes sociais e apoio social, que podem não fornecer uma visão completa do capital social, indicando uma limitação desse estudo. No entanto, as teorias em torno do capital social ainda estão em processo de desenvolvimento e não há um consenso quanto a sua definição e mensuração. Além disso, a introdução de novos conceitos na ciência frequentemente dá origem a resistência e críticas. Contudo, este estudo também tem pontos fortes. Trata-se de um estudo de coorte de longo prazo com uma taxa de retenção na coorte de 70,3% após sete anos, indicando a validade externa de nossos achados.

Os presentes achados suportaram a hipótese de que o capital social individual e comunitário influenciam a QVRSB ao longo da infância. Este estudo é a avaliação longitudinal da influência de fatores psicossociais na QVRSB em um estágio de transição na vida das crianças, o que fornece evidências para o desenvolvimento de uma ampla promoção da saúde bucal nessa faixa etária com o objetivo de melhorar a QVRSB ao longo da vida.

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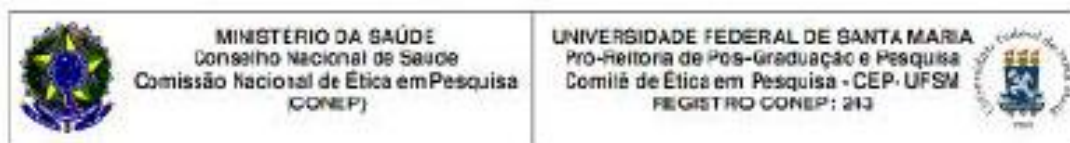
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WHO. **The World Oral Health Report 2003: continuous improvement of oral health in the 21st century - the approach of the WHO Global Oral Health Programme**. In. Geneva, Switzerland World Health Organization; 2003.

WILSON, I. B.; CLEARY, P. D. Linking clinical variables with health-related quality of life. A conceptual model of patient outcomes. **The Journal of the American Medical Association**, v.273, n.1, p.59-65, 1995.

## ANEXO A – CARTA DE APROVAÇÃO DO COMITÊ DE ÉTICA EM PESQUISA NO ANO DE 2010



### CARTA DE APROVAÇÃO

O Comitê de Ética em Pesquisa – UFSM, reconhecido pela Comissão Nacional de Ética em Pesquisa – (CONEP/MS) analisou o protocolo de pesquisa:

**Título:** Associação da presença e atividade de lesões de cárie em dentes deciduos com indicadores de risco biológicos e socioeconômicos

**Número do processo:** 23081.015459/2009-91

**CAAE (Certificado de Apresentação para Apreciação Ética):** 0270.0.243.000-09

**Pesquisador Responsável:** Thiago Machado Ardenghi


Este projeto foi APROVADO em seus aspectos éticos e metodológicos de acordo com as Diretrizes estabelecidas na Resolução 196/96 e complementares do Conselho Nacional de Saúde. Toda e qualquer alteração do Projeto, assim como os eventos adversos graves, deverão ser comunicados imediatamente a este Comitê. O pesquisador deve apresentar ao CEP:

Janeiro/ 2011- **Relatório final**

Os membros do CEP-UFSM não participaram do processo de avaliação dos projetos onde constam como pesquisadores.

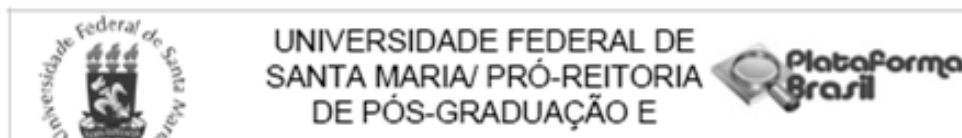
**DATA DA REUNIÃO DE APROVAÇÃO:** 15/12/2009

Santa Maria, 29 de Dezembro de 2009.



Elsete Medianeira Tomazetti  
Coordenadora do Comitê de Ética em Pesquisa-UFSM  
Registro CONEP N. 243.

## ANEXO B – CARTA DE APROVAÇÃO DO COMITÊ DE ÉTICA EM PESQUISA NO ANO DE 2017



UNIVERSIDADE FEDERAL DE  
SANTA MARIA/ PRÓ-REITORIA  
DE PÓS-GRADUAÇÃO E



### PARECER CONSUBSTANCIADO DO CEP

#### DADOS DO PROJETO DE PESQUISA

**Título da Pesquisa:** AVALIAÇÃO DO RISCO DE DESENVOLVIMENTO DE LESÕES DE CÁRIE, FATORES RELACIONADOS E ALTERAÇÕES NO IMPACTO NA QUALIDADE DE VIDA DE CRIANÇAS.

**Pesquisador:** Thiago Machado Ardenghi

**Área Temática:**

**Versão:** 2

**CAAE:** 54257216.1.0000.5346

**Instituição Proponente:** Departamento de Estomatologia

**Patrocinador Principal:** Financiamento Próprio

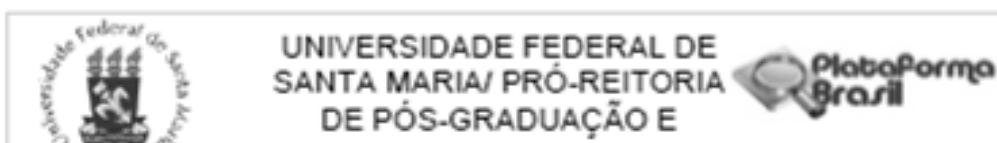
#### DADOS DO PARECER

**Número do Parecer:** 1.525.380

#### Apresentação do Projeto:

Corresponde a um projeto de doutorado vinculado ao Programa de Pós-Graduação em Ciências Odontológicas e está assim apresentado: "Condições bucais adversas permanecem sendo um problema altamente prevalente e atingem cerca de quatro bilhões de indivíduos no mundo todo. A cárie dentária é considerada a doença crônica mais comum na infância, com prevalência variando de 60% a 90% na população infantil mundial durante a primeira década de vida. A literatura tem demonstrado as consequências que a cárie pode trazer para os indivíduos tanto na fase inicial da vida, quanto ao longo do tempo, trazendo implicações também para a vida adulta. Estudos de associação, como o caso dos transversais, são de extrema importância para o conhecimento de fatores de risco para a cárie, no entanto, tais estudos não são capazes de relevar relações causais entre diferentes exposições e o desfecho em questão. Para um melhor entendimento a respeito de causalidade, fazem-se necessários estudos longitudinais que avaliem as complexas relações entre os diferentes fatores ou indicadores associados a doença. O objetivo desse estudo longitudinal será avaliar o caminho pelo qual os fatores demográficos, socioeconômicos, psicossociais e comportamentais influenciam na ocorrência de lesões de cárie em primeiros molares permanentes em crianças. Esse estudo será realizado em Santa Maria, RS, Brasil e trata-se da terceira avaliação de uma coorte de crianças, que neste momento terão entre 7 e 11 anos de idade. Será realizada

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**Bairro:** Camobi **CEP:** 97.105-970  
**UF:** RS **Município:** SANTA MARIA  
**Telefone:** (55)3220-9362 **E-mail:** cep.ufsm@gmail.com



Continuação do Parecer: 1.525.380

uma nova avaliação de saúde bucal através de exames clínicos e questionários. O International Caries Detection Assessment System (ICDAS) será usado para avaliar a presença de cárie em Primeiros Molares. Dados a respeito de condições demográficas como sexo e cor da pele, socioeconômicas como renda familiar e escolaridade dos pais, psicossociais e comportamentais relacionadas ao uso de serviços e hábitos de higiene serão coletados através de um questionário semiestruturado. A qualidade de vida relacionada a saúde bucal será avaliada através do Child Perception Questionnaire (CPQ) na sua versão brasileira para crianças de 8-10 anos (CPQ 8-10). Os dados serão analisados utilizando o programa STATA 12. Será utilizada a análise por Modelos de Equações Estruturais (MEE) a qual permite que o modelo hipotético possa ser testado estatisticamente. A magnitude e a significância das relações entre as variáveis entre si e com o desfecho serão avaliadas através de um coeficiente de regressão ( $\beta$ ) e valores de p que, quando 0,05 serão considerados estatisticamente significantes.\*

Projeto apresenta ornamento e cronograma adequados e compatíveis.

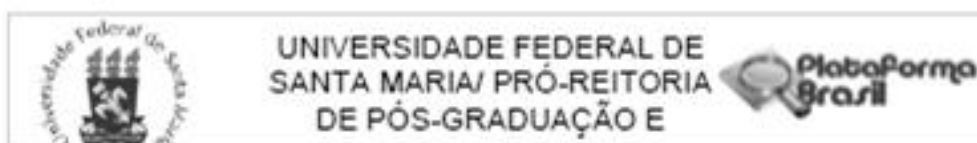
#### Objetivo da Pesquisa:

Objetivo geral: avaliar o caminho pelo qual os fatores demográficos, socioeconômicos, psicossociais e comportamentais, ao nível do indivíduo e do contexto, influenciam na ocorrência de lesões de cárie em primeiros molares permanentes em crianças.

#### Objetivos específicos:

- Avaliar, por meio de exames clínicos, a ocorrência de lesões de cárie em Primeiros Molares Permanentes.
- Avaliar se existe associação entre fatores demográficos, como idade, sexo e raça, e a incidência de lesões.
- Avaliar se fatores socioeconômicos, individuais e contextuais, estão associados a ocorrência de lesões de cárie nos primeiros molares permanentes.
- Verificar se há associação entre fatores psicossociais, como auto percepção de saúde bucal e qualidade de vida relacionada a saúde bucal, e a ocorrência de lesões em molares permanentes.
- Avaliar se os fatores comportamentais, como hábito de higiene e uso de serviços exercem influência sobre a incidência de lesões de cárie em dentes permanentes.
- Avaliar se as alterações nas condições de saúde bucal relacionadas a cárie dentária se refletem no impacto sobre a qualidade de vida e persistem ao longo do tempo.

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 UF: RS Município: SANTA MARIA  
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Contribuição do Pesquisador: 1.526,300

**Avaliação dos Riscos e Benefícios:**

Riscos são assim descritos: "Como esta pesquisa se trata apenas de uma entrevista e um exame bucal, os riscos previstos são mínimos, a criança poderá ficar cansado(a) ao fazer o exame e os pais/responsáveis poderão ficar constrangidos em responder alguma pergunta. Caso isto ocorra, as perguntas poderão não ser respondidas, o exame poderá ser cancelado e/ou os pais/responsáveis ou a criança poderão se recusar a participar da pesquisa a qualquer momento sem que haja qualquer problema."

Benefícios: "Os participantes não receberão benefícios diretos com a pesquisa, entretanto, como benefício indireto, caso a criança precise de algum tratamento odontológico, será encaminhado para atendimento na Clínica de Odontopediatria da UFSM e, ainda, os participantes contribuirão para melhor entendimento científico a respeito do tema pesquisado. Os indivíduos não receberão qualquer remuneração financeira por essa participação."

Considerando os objetivos da pesquisa e os procedimentos realizados, riscos e benefícios estão descritos de maneira adequada.

**Comentários e Considerações sobre a Pesquisa:**

O projeto está bem escrito e apresentado. Possui tema relevante pois procura entender os determinantes e fatores de risco para o desenvolvimento da doença cárie em crianças.

**Considerações sobre os Termos de apresentação obrigatória:**

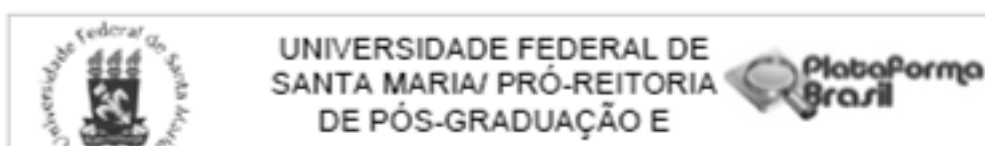
Registro no GAP, Folha de Rosto, Termo de Confidencialidade e Autorização Institucional estão apresentados de maneira adequada.

TCLE e termo de assentimento estão apresentados de maneira adequada.

**Recomendações:**

Veja no site do CEP - <http://w3.ufsm.br/nucleodecomites/index.php/cep> - na aba "orientações gerais", modelos e orientações para apresentação dos documentos. Acompanhe as orientações disponíveis, evite pendências e agilize a tramitação do seu projeto.

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Continuação do Parecer: 1.525.300

**Conclusões ou Pendências e Lista de Inadequações:**

O projeto não apresenta pendências e pode ser aprovado.

**Considerações Finais a critério do CEP:**

Este parecer foi elaborado baseado nos documentos abaixo relacionados:

Tipo Documento	Arquivo	Postagem	Autor	Situação
Informações Básicas do Projeto	PB_INFORMAÇÕES_BÁSICAS_DO_PROJETO_675434.pdf	25/04/2016 10:45:52		Aceito
TCLE / Termos de Assentimento / Justificativa de Ausência	Termo_de_Assentimento.pdf	25/04/2016 10:44:33	Thiago Machado Ardenghi	Aceito
Outros	Registro_GAP.pdf	16/03/2016 11:29:31	Thiago Machado Ardenghi	Aceito
Outros	Termo_de_Confidencialidade.pdf	16/03/2016 11:17:30	Thiago Machado Ardenghi	Aceito
Declaração de Instituição e Infraestrutura	Declaracao_instituicao.pdf	07/03/2016 16:22:03	Thiago Machado Ardenghi	Aceito
TCLE / Termos de Assentimento / Justificativa de Ausência	TCLE.pdf	07/03/2016 16:19:35	Thiago Machado Ardenghi	Aceito
Projeto Detalhado / Brochura Investigador	Projeto_doutorado.pdf	07/03/2016 16:18:31	Thiago Machado Ardenghi	Aceito
Folha de Rosto	folha_de_rosto.pdf	07/03/2016 16:16:00	Thiago Machado Ardenghi	Aceito

**Situação do Parecer:**

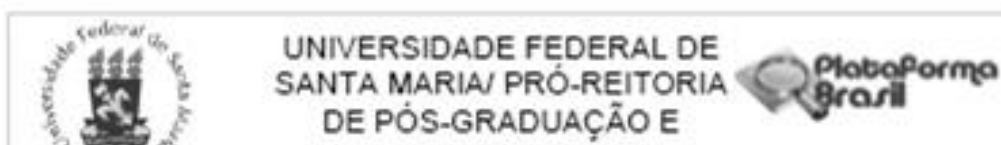
Aprovado

**Necessita Apreciação da CONEP:**

Não

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Continuação do Pensar: 1.525.380

SANTA MARIA, 02 de Maio de 2016

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Assinado por:  
CLAUDEMIR DE QUADROS  
(Coordenador)

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## **ANEXO C – NORMAS PARA PUBLICAÇÃO NO PERIÓDICO *QUALITY OF LIFE RESEARCH***

### ARTICLE TYPES

#### **Quality of Life Research welcomes scientific articles in the following categories:**

- Full-Length Original Articles (must include a 250-word structured abstract, maximum word limit of 4,000 words exclusive of abstract, tables, figures, and references);
- Brief Communications (maximum word limit of 1,500 words, exclusive of structured abstract, tables, figures, and references). See section below on Brief Communications.

#### **Full-Length Original Articles**

Original articles are a maximum of 4,000 words, exclusive of a 250-word structured abstract, figures, tables, and references. We are particularly interested in studies that utilize patient-reported outcomes, focusing on clinical and policy applications of quality-of-life research; showcasing quantitative and qualitative methodological advances; and/or describing instrument development.

#### **Brief Communications**

Brief communications are a maximum of 1,500 words, exclusive of a 200-word structured abstract, up to 2 figures, up to 3 tables, and 25 references. Any topic can be submitted as a brief communication, but all manuscripts that report cross-cultural adaptations of existing measures will only be considered for publication as brief communications in *Quality of Life Research*. If a paper of this type provides substantially new methodological and/or substantive knowledge (e.g., a superior method of cross cultural adaptation, more thorough evaluation of the original instrument being adapted, multi-language or multi-country comparisons, etc.), authors should include a letter with their submission justifying the need for a full length report. All cross-cultural translation articles should include information in the abstract and manuscript text that summarize how psychometric characteristics of the new translation compares to the original tool.

#### **Other Types of Articles**

The journal also publishes commentaries and editorials; reviews of the literature; reviews of recent books and software advances; and abstracts presented at the annual meeting of the International Society of Quality of Life Research conference. These articles should be as long as needed to convey the desired information, and no more than 4,000 words in length. To the extent that it is possible, a structured abstract is appreciated.

#### Language

We appreciate any efforts that you make to ensure that the language usage is corrected before submission using standard United States or United Kingdom English. This will greatly improve the legibility of your paper if English is not your first language.

### MANUSCRIPT SUBMISSION

#### Manuscript Submission

Submission of a manuscript implies: that the work described has not been published before; that it is not under consideration for publication anywhere else; that its publication has been approved by all co-authors, if any, as well as by the responsible authorities – tacitly or explicitly – at the institute where the work has been carried out. The publisher will not be held legally responsible should there be any claims for compensation.

#### Permissions

Authors wishing to include figures, tables, or text passages that have already been published elsewhere are required to obtain permission from the copyright owner(s) for both the print and online format and to include evidence that such permission has been granted when submitting their papers. Any material received without such evidence will be assumed to originate from the authors.

#### Online Submission

Please follow the hyperlink “Submit online” on the right and upload all of your manuscript files following the instructions given on the screen.

### TITLE PAGE

#### Title Page

The title page should include:

The name(s) of the author(s)  
 A concise and informative title  
 The affiliation(s) and address(es) of the author(s)  
 The e-mail address, and telephone number(s) of the corresponding author  
 If available, the 16-digit ORCID of the author(s)

#### Abstract

Please provide a structured abstract of 150 to 250 words which should be divided into the following sections:

Purpose (stating the main purposes and research question)  
 Methods  
 Results  
 Conclusions

#### Keywords

Please provide 4 to 6 keywords which can be used for indexing purposes.

#### TEXT

##### Text Formatting

Manuscripts should be submitted in Word.

Use a normal, plain font (e.g., 10-point Times Roman) for text.

Use italics for emphasis.

Use the automatic page numbering function to number the pages.

Do not use field functions.

Use tab stops or other commands for indents, not the space bar.

Use the table function, not spreadsheets, to make tables.

Use the equation editor or MathType for equations.

Save your file in docx format (Word 2007 or higher) or doc format (older Word versions).

Manuscripts with mathematical content can also be submitted in LaTeX.

##### Headings

Please use no more than three levels of displayed headings.

##### Abbreviations

Abbreviations should be defined at first mention and used consistently thereafter.

#### Footnotes

Footnotes can be used to give additional information, which may include the citation of a reference included in the reference list. They should not consist solely of a reference citation, and they should never include the bibliographic details of a reference. They should also not contain any figures or tables. Footnotes to the text are numbered consecutively; those to tables should be indicated by superscript lower-case letters (or asterisks for significance values and other statistical data). Footnotes to the title or the authors of the article are not given reference symbols. Always use footnotes instead of endnotes. Acknowledgments of people, grants, funds, etc. should be placed in a separate section on the title page. The names of funding organizations should be written in full.

#### SCIENTIFIC STYLE

Please always use internationally accepted signs and symbols for units (SI units). Generic names of drugs and pesticides are preferred; if trade names are used, the generic name should be given at first mention.

#### REFERENCES

##### Citation

Reference citations in the text should be identified by numbers in square brackets. Some examples:

1. Negotiation research spans many disciplines [3].
2. This result was later contradicted by Becker and Seligman [5].
3. This effect has been widely studied [1-3, 7].

##### Reference list

The list of references should only include works that are cited in the text and that have been published or accepted for publication. Personal communications and unpublished works should only be mentioned in the text.

Do not use footnotes or endnotes as a substitute for a reference list. The entries in the list should be numbered consecutively.

#### Journal article

Harris, M., Karper, E., Stacks, G., Hoffman, D., DeNiro, R., Cruz, P., et al. (2001). Writing labs and the Hollywood connection. *Journal of Film Writing*, 44(3), 213–245.

#### Article by DOI

Kreger, M., Brindis, C.D., Manuel, D.M., & Sassoubre, L. (2007). Lessons learned in systems change initiatives: benchmarks and indicators. *American Journal of Community Psychology*. <https://doi.org/10.1007/s10464-007-9108-14>.

#### Book

Calfee, R. C., & Valencia, R. R. (1991). *APA guide to preparing manuscripts for journal publication*. Washington, DC: American Psychological Association.

#### Book chapter

O'Neil, J. M., & Egan, J. (1992). Men's and women's gender role journeys: Metaphor for healing, transition, and transformation. In B. R. Wainrib (Ed.), *Gender issues across the life cycle* (pp. 107–123). New York: Springer.

#### Online document

Abou-Allaban, Y., Dell, M. L., Greenberg, W., Lomax, J., Peteet, J., Torres, M., & Cowell, V. (2006). Religious/spiritual commitments and psychiatric practice. Resource document. American Psychiatric Association. [http://www.psych.org/edu/other\\_res/lib\\_archives/archives/200604.pdf](http://www.psych.org/edu/other_res/lib_archives/archives/200604.pdf). Accessed 25 June 2007.

Journal names and book titles should be italicized.

For authors using EndNote, Springer provides an output style that supports the formatting of in-text citations and reference list.

## TABLES

All tables are to be numbered using Arabic numerals.

Tables should always be cited in text in consecutive numerical order.

For each table, please supply a table caption (title) explaining the components of the table.

Identify any previously published material by giving the original source in the form of a reference at the end of the table caption.

Footnotes to tables should be indicated by superscript lower-case letters (or asterisks for significance values and other statistical data) and included beneath the table body.

## ARTWORK AND ILLUSTRATIONS GUIDELINES

### Electronic Figure Submission

Supply all figures electronically. Indicate what graphics program was used to create the artwork. For vector graphics, the preferred format is EPS; for halftones, please use TIFF format. MSOffice files are also acceptable. Vector graphics containing fonts must have the fonts embedded in the files. Name your figure files with "Fig" and the figure number, e.g., Fig1.eps. Line Art

### Figure Lettering

To add lettering, it is best to use Helvetica or Arial (sans serif fonts). Keep lettering consistently sized throughout your final-sized artwork, usually about 2–3 mm (8–12 pt). Variance of type size within an illustration should be minimal, e.g., do not use 8-pt type on an axis and 20-pt type for the axis label. Avoid effects such as shading, outline letters, etc. Do not include titles or captions within your illustrations.

### Figure Numbering

All figures are to be numbered using Arabic numerals. Figures should always be cited in text in consecutive numerical order. Figure parts should be denoted by lowercase letters (a, b, c, etc.). If an appendix appears in your article and it contains one or more figures, continue the consecutive numbering of the main text. Do not number

the appendix figures, "A1, A2, A3, etc." Figures in online appendices (Electronic Supplementary Material) should, however, be numbered separately.

#### Figure Captions

Each figure should have a concise caption describing accurately what the figure depicts. Include the captions in the text file of the manuscript, not in the figure file. Figure captions begin with the term Fig. in bold type, followed by the figure number, also in bold type. No punctuation is to be included after the number, nor is any punctuation to be placed at the end of the caption. Identify all elements found in the figure in the figure caption; and use boxes, circles, etc., as coordinate points in graphs. Identify previously published material by giving the original source in the form of a reference citation at the end of the figure caption.

#### Figure Placement and Size

Figures should be submitted separately from the text, if possible. When preparing your figures, size figures to fit in the column width. For most journals the figures should be 39 mm, 84 mm, 129 mm, or 174 mm wide and not higher than 234 mm. For books and book-sized journals, the figures should be 80 mm or 122 mm wide and not higher than 198 mm.

#### Permissions

If you include figures that have already been published elsewhere, you must obtain permission from the copyright owner(s) for both the print and online format. Please be aware that some publishers do not grant electronic rights for free and that Springer will not be able to refund any costs that may have occurred to receive these permissions. In such cases, material from other sources should be used.

#### Accessibility

In order to give people of all abilities and disabilities access to the content of your figures, please make sure that All figures have descriptive captions (blind users could then use a text-to-speech software or a text-to-Braille hardware) Patterns are used instead of or in addition to colors for conveying information (colorblind users would then be able to distinguish the visual elements) Any figure lettering has a contrast ratio of at least 4.5:1

#### ELECTRONIC SUPPLEMENTARY MATERIAL

Springer accepts electronic multimedia files (animations, movies, audio, etc.) and other supplementary files to be published online along with an article or a book chapter. This feature can add dimension to the author's article, as certain information cannot be printed or is more convenient in electronic form. Before submitting research datasets as electronic supplementary material, authors should read the journal's Research data policy. We encourage research data to be archived in data repositories wherever possible.

#### Submission

Supply all supplementary material in standard file formats.

Please include in each file the following information: article title, journal name, author names; affiliation and e-mail address of the corresponding author.

To accommodate user downloads, please keep in mind that larger-sized files may require very long download times and that some users may experience other problems during downloading. Audio, Video, and Animations

Processing of supplementary files

Electronic supplementary material will be published as received from the author without any conversion, editing, or reformatting.

#### Accessibility

In order to give people of all abilities and disabilities access to the content of your supplementary files, please make sure that The manuscript contains a descriptive caption for each supplementary material Video files do not contain anything that flashes more than three times per second (so that users prone to seizures caused by such effects are not put at risk).

#### ENGLISH LANGUAGE EDITING

For editors and reviewers to accurately assess the work presented in your manuscript you need to ensure the English language is of sufficient quality to be understood. If you need help with writing in English you should consider:

Asking a colleague who is a native English speaker to review your manuscript for clarity. Visiting the English language tutorial which covers the common mistakes when writing in English. Using a professional language

editing service where editors will improve the English to ensure that your meaning is clear and identify problems that require your review. Two such services are provided by our affiliates Nature Research Editing Service and American Journal Experts. Springer authors are entitled to a 10% discount on their first submission to either of these services, simply follow the links below.

English language tutorial

Nature Research Editing Service

American Journal Experts

Please note that the use of a language editing service is not a requirement for publication in this journal and does not imply or guarantee that the article will be selected for peer review or accepted.

If your manuscript is accepted it will be checked by our copyeditors for spelling and formal style before publication.

#### ETHICAL RESPONSIBILITIES OF AUTHORS

This journal is committed to upholding the integrity of the scientific record. As a member of the Committee on Publication Ethics (COPE) the journal will follow the COPE guidelines on how to deal with potential acts of misconduct. Authors should refrain from misrepresenting research results which could damage the trust in the journal, the professionalism of scientific authorship, and ultimately the entire scientific endeavour. Maintaining integrity of the research and its presentation can be achieved by following the rules of good scientific practice, which include: The manuscript has not been submitted to more than one journal for simultaneous consideration.

The manuscript has not been published previously (partly or in full), unless the new work concerns an expansion of previous work (please provide transparency on the re-use of material to avoid the hint of text-recycling (“self-plagiarism”)).

A single study is not split up into several parts to increase the quantity of submissions and submitted to various journals or to one journal over time (e.g. “salami-publishing”). No data have been fabricated or manipulated (including images) to support your conclusions.

No data, text, or theories by others are presented as if they were the author’s own (“plagiarism”). Proper acknowledgements to other works must be given (this includes material that is closely copied (near verbatim), summarized and/or paraphrased), quotation marks are used for verbatim copying of material, and permissions are secured for material that is copyrighted.

Important note: the journal may use software to screen for plagiarism.

Consent to submit has been received explicitly from all co-authors, as well as from the responsible authorities - tacitly or explicitly - at the institute/organization where the work has been carried out, before the work is submitted.

Authors whose names appear on the submission have contributed sufficiently to the scientific work and therefore share collective responsibility and accountability for the results.

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