Original Article

Influence of social capital on self-perception related to orthodontic treatment need

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Aim: To evaluate the influence of social capital on self-perception related to orthodontic treatment need. **Methods:** A cross-sectional study was conducted with a sample of 578 11-16 years-old adolescents from a city in southern Brazil. Social capital was evaluated using the Social Capital Questionnaire for Adolescent Students (SCQ-AS). Index of Orthodontic Treatment Need (IOTN) assessed malocclusion and self-perception related to orthodontic treatment need. Sociodemographic aspects of adolescents were also evaluated. Individual analyses were performed, relating the study variables to the outcome, estimating the odds ratio with the respective confidence intervals of 95%. The variables with $p<0.20$ in the individual analyses were tested in the multiple logistic regression models, and those with $p<0.10$ remained in the model. **Results:** Social capital did not influence the self-perception related to orthodontic treatment need. Adolescents with high orthodontic needs were 5.35 (CI 95%: 2.68 to 10.65) times more likely to perceived orthodontic treatment need ($p<0.05$). Crowding and dental absence were associated with self-perception related to orthodontic treatment need ($p<0.05$). **Conclusions:** Social capital did not influence the self-perception related to orthodontic treatment need.

Keywords: Index of orthodontic treatment need. Orthodontics. Self-concept. Social capital.

Introduction

Oral health is a fundamental component of physical health and mental well-being. The values and attitudes of individuals and communities can influence oral health, as well as their experiences, perceptions, expectations and adaptability, reflecting on the physiological, social and psychological aspects that are essential for life quality[1].

Considering the assessment of oral health, malocclusion is a condition of high prevalence[2], with direct influence on quality of life. In addition has the potential to affect biological functions, appearance, interpersonal relationships, socialization, self-esteem and psychosocial well-being[3,4]. On the other hand, there is no consensus if the orthodontic treatment need is perceived by adolescents[5-7]. Adolescents are a group exposed to situations of physical, emotional and social risks due to the environmental context[8]. Thus, the change from the traditional orthodontic model to a more biopsychosocial model increased interest of the literature[9].

In the broader context of health, social capital can be defined as the interpersonal relationship networks that occur at different levels and positions of power and which have trust and reciprocity as foundations[10,11]. The possible influence of social capital on oral health has been highlighted from the social support[12], bond and mutual understanding which contribute to the self-esteem, population well-being, quality of life and health[11-17]. Recent studies reported that the social capital can reduce the negative effects of social inequality, it seems to be related to the political interest of the parents of adolescents[12] and it can be seen as a protective factor, in socially disadvantaged locations[8,11,16,18]. This concept has been used increasingly in several aspects of mental health, self-assessment in health and, especially, oral health[8,11-17,19,20]. Although the evidences in oral health are at an early stage of development, social capital is defined as a potential social determinant of oral health[12].

Literature still lacks answers about the relationship between oral health and social capital[13,14,16,17,21]. According to a recent study, the association between income inequality and the oral health-related quality of life can be attenuated by contextual social capital[21]. On the other hand, did not affect the relationship between income inequality and oral disease, identified by professional[21]. In the same context of social capital, no relationship was found with dental trauma and alcohol consumption in adolescents[17]; however, the socioeconomic status and features of social capital may be associated with the levels of gingival bleeding among[20]. In addition, there was an effect of support and social cohesion on the caries index[14], in adolescents and adults[16], in a contextual level[13,16]. There is still limited and inconsistent evidence on the association between individual social capital and oral health in in the population of children and adolescents[20]. Likewise, it is important in the oral health context to include the study of the impact of orthodontic treatment need on social capital.

Therefore, the aim of this study was to evaluate the influence of social capital on self-perception related to orthodontic treatment need in adolescents. The hypothesis was that the perceived orthodontic treatment need has an impact on social capital.

Materials and Methods

Study design and study population

This cross-sectional study received ethical approval from the Research Ethics Committee (#65187817.8.0000.5385), and was carried out in south Brazil, in a city with 61,198 inhabitants, an 96.5% literacy rate and a human development index (HDI) of 0.802, between March and May 2017. All adolescents consented to participate, and their parents or guardians signed an informed consent form.

The sample size was calculated considering a 5% significance level, test power greater than 80%, and 1.7 effect size, obtaining a minimum of 495 individuals. Adolescents enrolled in public and private schools were invited to participate in the study, and only adolescents in permanent dentition were included. Exclusion criteria were current or previous orthodontic treatment and systemic diseases, such as cerebral palsy or Down syndrome. The final sample included 578 students (314 girls and 264 boys), aged 11-16-years-old.

Parents answered a sociodemographic questionnaire with information regarding family income, number of people living in the house, and level of parental education. Family income was determined based on the sum of all salaries received by active residents in the home and categorized based on the current Brazilian minimum salary; the threshold was the median response (R$ 3.000). Mother and father's schooling were defined as the number of years of study, with eight years used as the cut-off point; the threshold was the median response.

Social Capital

The self-administered instrument used to evaluate the adolescents social capital was the Social Capital Questionnaire for Adolescent Students (SCQ-AS), developed and validated in Brazil[22]. This questionnaire is composed of items selected from the national and international literature and has been submitted to face validation, content analysis and analyses of internal consistency, reliability and reproducibility. The SCQ-AS questionnaire is composed of 12 items grouped into four subscales: Social Cohesion at School; Network of Friends at School; Social Cohesion in the Community/Neighborhood; and Trust at School and in the Community/Neighborhood. The answers are given in a three-point Likert scale and scores range from 12 to 36 points, with a higher score denoting greater social capital. For this study, the median was adopted to dichotomize the value in high and low social capital[17,22].

Self-perception related to orthodontic treatment need

The self-perception related to orthodontic treatment need was determined by the Aesthetic Component (AC) of the Index of Orthodontic Treatment Need (IOTN)[12]. This index consists of a visual scale of 10 photographs of different dental arrangements, which allows adolescents to identify which photograph most closely resembles the appearance of their teeth[23]. The photographs from 1 to 4 are classified as no or slight need for treatment, from 5 to 7 as moderate and from 8 to 10 as severe[6,7,23]. In this study, responses from 1 to 4 were considered without orthodontic treatment need, and equal to or greater than 5, with perceived orthodontic treatment need[24].

Normative orthodontic treatment need

The Dental Health Component (DHC) of IOTN was used for a clinical assessment of orthodontic treatment need. The data were collected with the adolescents seated, under natural light, using a wooden spatula and a millimeter probe. The IOTN-DHC categorizes the unfavorable effects of different deviant occlusal traits into five grades scale of orthodontic treatment priority, and the most severe change is used for index determination. The following features are evaluated: missing teeth, overjet, crossbite, displacement of contact points (also called crowding), and overbite (including deep bite and open bite). The sample was classified as having no need for treatment when IOTN-DHC was 1 and 2, moderate need when it was 3 and high need for normative orthodontic treatment when it was 4 and 5[6,25]. In addition, individual aspects of malocclusion were analyzed from the IOTN-DHC components: overjet, negative overjet, overbite, open bite, crowding, posterior crossbite, dental absence and special cases. Any of the conditions mentioned are considered special cases: cleft lip; ankylosed primary tooth; dental rash prevented by crowding, incorrect dental positioning, supernumerary tooth, retained primary tooth or pathology; partially erupted; inclined or impacted tooth; and, supernumerary tooth[23].

Training and Calibration

A previously trained examiner performed the exams under artificial light at the schools. Before the study began, a calibration process was conducted to obtain acceptable consistency for the malocclusion. The training stage consisted of a theoretical discussion followed by a practical stage. During training and calibration, the inter and intra-examiner agreement was estimated with the intraclass correlation coefficient (ICC) for the components of the IOTN-DHC, with an acceptable limit value greater than 0.97.

Statistical analysis

Data analysis was adjusted in simple logistic regression models, estimating the odds ratios (OR) with their respective confidence intervals of 95%. The variables with $p \leq 0.20$ in the individual analyzes, for each outcome variable, were tested in multiple logistic regression models, with the remaining variables being $p \leq 0.10$. From the models, the adjusted odds ratios were estimated with the respective confidence intervals of 95%. The analyses were performed in the SAS (release 9.2, SAS Institute Inc., Cary, NC, USA). The association of clinical evaluation and self-perception related to orthodontic treatment need was performed by the Chi-square test in the Epi Info (version 7.02, Centers for Disease Control and Prevention, Atlanta, Georgia, USA).

Results

The sample consisted of 578 adolescents, 314 girls and 264 boys aged 11-16-years-old. A total of 74% of adolescents were from families that earned up to three times the Brazilian monthly minimum wage, 47.9% of the fathers and 50.7% of the mothers had more than eight years of schooling, and 63.5% with more than four people living in the house. The adolescents presented a high social capital, with a median of 32.

According to Table 1, adolescents with high treatment needs showed 5.35 (95% CI: 2.68 to 10.65) times more likely to perceive the need for orthodontic treatment (p<0.05). There was no significant association between sociodemographic variables, social capital and self-perception related to orthodontic treatment need (p> 0.05).

Table 2 showed that in 11.1% of adolescents who perceived the orthodontic treatment need, the presence of crowding or the absence of some dental element were the components associated with the treatment need perception, and crossbite obtained a score very close to significance.

Discussion

The social context can exert influence on health-related behavior[10,17]. However, the majority of the studies was carried out with populations of adults[14,15,18,19,21] and little is known regarding the relationship between social capital and health outcomes among adolescents[8,16,17,20], particularly on the impact of malocclusion. This study will contribute to the literature with an understanding of how the capital social influence the self-perception related to orthodontic treatment need.

The study findings shows that social capital was not associated with the self-perception related to orthodontic treatment need. There is a growing application of the concept of social capital in various aspects of mental health, self-evaluation in health and, particularly, in oral health[8,11-17,19]. In addition, the self-perception of orthodontic treatment need (IONT-AC) is influenced by several aspects, including self-esteem[26-29]. This relationship may have affected the results of this study, since the average social capital was high and the need for perceived treatment was low, possibly modulated by self-esteem.

There are no reports in the literature of studies associating malocclusion and social capital. The evaluation of social capital can be performed at different levels, both individual and contextual[10,11]. Regardless of this assessment, there is a diversity of results when associated with other aspects of oral health. There are reports that the individual social capital was relevant in the quality of life related to the oral health of pregnant women[30] and influenced the report of toothache[15]. Neighborhood and family social capital also has influenced oral health reported by parents of children[31] and dental losses in adults are more frequent when there is less social capital[18]. However, studies did not find an association between social capital and regular dental brushing, visits to the dentist, time of the last visit[15] and dental trauma[17]. Therefore, there is no consensus about the influence of social capital on oral health and when present, whether it is on an individual or collective level. The diversity of results may be related to the sociocultural environment[8], as well as the variety of tools and methodologies making it difficult to compare studies[19]. In this study, individual social capital evaluated characteristics such as trust[11] and cohesion[28] of adolescents, through the subscales of the Social Capital Questionnaire for Adolescent Students[22]. It is important to highlight that the population studied belongs to a city in the south of Brazil with a high human development index, compared to other cities in the country.

The present study showed that 11.11% of adolescent's perceived orthodontic treatment need (IOTN-AC); such prevalence in the literature ranges from 10 to 40%[5,6].

Table 1. Associations between the self-perception related to orthodontic treatment need (IOTN-AC), normative orthodontic treatment need (IOTN-DHC), sociodemographic variables and Social Capital.

Variables	Category	n(%)	Self-perception related to orthodontic treatment need		*Gross OR (§IC95%)	p-value	OR – final model (IC95%)	p-value
			No need	Need [&]				
Gender	Female	314 (54.3%)	283 (90.1%)	31 (9.9%)	Ref			
	Male	264 (45.7%)	231 (87.5%)	33 (12.5%)	1.30 (0.78- 2.19)	0.317		
Age	≤ 12 years old#	307 (53.1%)	271 (88.3%)	36 (11.7%)	1.15 (0.68-1.95)	0.594		
	> 12 years old	271 (46.9%)	243 (89.7%)	28 (10.3%)	Ref			
Income	≤ R$ 3.000#	428 (74.0%)	383 (89.5%)	45 (10.5%)	Ref			
	> R$ 3.000	137 (23.7%)	119 (86.9%)	18 (13.1%)	1.29 (0.72-2.31)	0.396		
	No answer	13 (2.2%)	12 (92.3%)	1 (7.7%)	-			
School	Public	473 (81.8%)	419 (88.6%)	54 (11.4%)	1.22 (0.60-2.49)	0.577		
	Private	105 (18.2%)	95 (90.5%)	10 (9.5%)	Ref			
Father's education level	Up to 8th grade#	277 (47.9%)	252 (91.0%)	25 (9.0%)	Ref			
	Above 8th grade	213 (36.9%)	184 (86.4%)	29 (13.6%)	1.59 (0.90-2.80)	0.109		
	No answer	88 (15.2%)	78 (88.6%)	10 (11.4%)	-			
Mother's level of education	Up to 8th grade#	293 (50.7%)	262 (89.4%)	31 (10.6%)	Ref			
	Above 8th grade	274 (47.4%)	243 (88.7%)	31 (11.3%)	1.08 (0.64-1.83)	0.779		
	No answer	11 (1.9%)	9 (81.8%)	2 (18.2%)	-			
People living in the same house	Up to 4#	367 (63.5%)	323 (88.0%)	44 (12.0%)	1.36 (0.77-2.39)	0.293		
	More than 4	208 (36.0%)	189 (90.9%)	19 (9.1%)	Ref			
	No answer	3 (0.5%)	2 (66.7%)	1 (33.3%)	-			
Orthodontics need (IOTN-DHC)	No/light need	245 (42.4%)	234 (95.5%)	11 (4.5%)	Ref		Ref	
	Moderate need	114 (19.7%)	105 (92.1%)	9 (7.9%)	1.82 (0.73-4.53)	0.237	1.82 (0.73-4.53)	0.2373
	High need	219 (37.9%)	175 (79.9%)	44 (20.1%)	5.35 (2.68-10.65)	<0.001	5.35 (2.68-10.65)	<0.0001
Social Capital	Low (≤ 32#)	358 (61.9%)	313 (87.4%)	45 (12.6%)	1.52 (0.86-2.67)	0.145		
	High (> 32)	220 (38.1%)	201 (91.4%)	19 (8.6%)	Ref			

* Odds ratio; §95% confidence interval; &Reference level; #Median.

Table 2. Association of self-perception related to orthodontic treatment need (IOTN-AC) and occlusal aspects, by IOTN-DHC components.

IOTN-DHC Components	Evaluation	Self-perception related to orthodontic treatment need				p-value
		No need		Need#		
		n	%	n	%	
Overjet	Altered	250	87.1%	37	12.9%	0.210
	Normal	264	90.7%	27	9.3%	
Negative overjet	Altered	26	81.2%	6	18.8%	0.256
	Normal	488	89.3%	58	10.7%	
Overbite	Altered	258	88.3%	34	11.7%	0.756
	Normal	256	89.5%	30	1.04%	
Open bite	Altered	48	87.3%	7	12.7%	0.609
	Normal	472	89.2%	57	10.7%	
Crowding	Altered	280	86.1%	45	13.9%	0.022*
	Normal	234	92.3%	19	7.5%	
Posterior crossbite	Altered	92	83.6%	18	16.4%	0.072
	Normal	422	90.2%	46	9.8%	
Dental Absence	Altered	36	78.3%	10	21.7%	0.031*
	Normal	478	89.8%	54	10.2%	
Special Cases&	Altered	70	86.4%	11	13.6%	0.558
	Normal	444	89.3%	53	10.6%	

Chi-square; # Median; *p<0.05; &cleft lip; ankylosed primary tooth; dental rash prevented by crowding, incorrect dental positioning, supernumerary tooth, retained primary tooth or pathology; partially erupted; inclined or impacted tooth; supernumerary tooth.

Higher values are expected since some studies have their samples composed by patients seeking orthodontic treatment[5], suggesting a greater perception of malocclusion. Apart from that, cultural differences can influence the aesthetic perception of different societies[32].

Recently, a study suggested that the greater the normative need for orthodontic treatment, the greater the need perceived by the patient[5]. Similar results were observed in this study, in which adolescents with a high need for normative treatment (IOTN-DHC) were more likely to need perceived treatment (IOTN-AC). Thus, although the need for perceived orthodontic treatment is low compared to normative, when it is high, it is suggested that it is more easily identified by adolescents, because the literature states that the psychosocial impact and self-perception of malocclusion increases with the increase in severity[25]. The presence of crowding and the absence of any dental elements were the normative components responsible for this perception; the crossbite obtained a score very close to significance suggesting that these components are more easily identified by lay people.

In this study there was no association between sociodemographic factors and need for treatment, agreeing with the previous study[6]. However, an association between normative, perceived need and age was found in the literature and the greater the age the greater the normative and perceived need[5], and there are also reports that increased age and low socioeconomic status were associated with the presence of malocclusion[4].

The differentials of our study was to evaluate the influence of social capital on the orthodontic treatment need. In addition, we included the normative need, assessed clinically, with that perceived by the adolescent. As a limitation, it is worth noting the cross-sectional study design, which evaluated the impact of social capital at a given period of time. A longitudinal design is suggested in order to improve the understanding this social influence over time. Finally, considering the results, the evaluation of the influence of social capital on the perception of the orthodontic treatment need should consider different amplitudes and forms of evaluation, sociodemographic diversities, and that aspects such as self-esteem can be related in this association.

In conclusion, social capital did not influence the self-perception of the orthodontic treatment need.

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