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O ESTRESSE OCUPACIONAL NA DISFUNÇÃO TEMPOROMANDIBULAR E A RESOLUTIVIDADE DAS TELECONSULTORIAS EM DOR OROFACIAL NO BRASIL

Universidade Federal de Minas Gerais
Faculdade de Odontologia
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Orientador: Mauro Henrique Nogueira Guimarães de Abreu

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DETERMINANTES OCUPACIONAIS DA DISFUNÇÃO TEMPOROMANDIBULAR E A RESOLUTIVIDADE DAS TELECONSULTORIAS EM DOR OROFACIAL NO BRASIL

RICARDO LUIZ DE BARRETO ARANHA

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Dedico este trabalho a meus pais, a meus familiares, aos amigos ou colegas de trabalho que, de uma forma ou de outra, contribuíram com informações, discussões e com o apoio pessoal necessário para a concretização deste projeto.

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“Existem muitas hipóteses em ciência que estão erradas. Isso é perfeitamente aceitável, elas são a abertura para achar as que estão certas.”

Carl Sagan

RESUMO

As disfunções temporomandibulares (DTM) formam um grupo heterogêneo de condições musculoesqueléticas que atingem a face em suas estruturas mastigatórias, causando limitação funcional ou dor que compõe uma categoria das dores orofaciais. Elas têm etiologia multifatorial, além serem reconhecidas como um problema de saúde pública. Por sua vez, a teleconsultoria assíncrona em saúde visa ao esclarecimento de dúvidas remetidas por profissionais de saúde aos núcleos de telessaúde, contemplando, dentre vários aspectos, diagnósticos e procedimentos clínicos. Com o advento da pandemia da COVID-19, o serviço ganhou nova dimensão, com potencial para permanecer como relevante ferramenta pós-pandemia. O presente trabalho utilizou duas abordagens metodológicas. A primeira teve o objetivo de desenvolver uma revisão sistemática sobre as relações entre estresse no trabalho – uma categoria de estresse - e as DTM. As buscas foram realizadas nas bases de dados Pubmed, Scopus, Web of Science, Lilacs, Embase, Google Scholar e Opengrey. Foi elaborada uma análise da qualidade metodológica dos artigos originais e de suas medidas de associação. A segunda avaliou por um estudo transversal a resolutividade de teleconsultorias nacionais assíncronas em DTM/dor orofacial do Programa Telessaúde Brasil Redes. Utilizou-se o banco de dados secundários do Sistema de Monitoramento e Avaliação de Resultados do Telessaúde (SMART), do período de 2019 a 2020 (antes e durante a pandemia de COVID-19). A variável dicotômica “Se evitou encaminhamento para atenção secundária” foi considerada o desfecho, representando a resolutividade do programa de teleconsultorias, confrontada com covariáveis de sexo e profissão dos demandantes, além das categorias de suas demandas. Foram elaborados uma análise descritiva dos dados, por meio de frequência, e um modelo de regressão binomial negativa para estimar as razões de prevalência não ajustadas e ajustadas (RP) com o intervalo de confiança de 95%. Como resultados da revisão sistemática, 12 de 602 artigos originais foram selecionados. Metade encontrou uma associação entre estresse no trabalho e DTM; sons da ATM (um sinal de DTM) e o estresse no trabalho foram associados apenas em uma população de músicos. Apenas 3 dos estudos usaram ferramentas validadas tanto para estresse quanto para DTM. Já para o estudo transversal, foram avaliadas 2.629 teleconsultorias, sendo 1.982 referentes a 2019 (75,4%). Em 2019, 1.522 (76,8%) evitaram o encaminhamento para a atenção secundária e, em 2020, 373 (57,7%) o fizeram. Os cirurgiões-dentistas (33,1%) e médicos (55,1%) compuseram a maioria de demandantes, e as dúvidas odontológicos (39,6%) e “outras” (58%) foram as mais frequentes. Como conclusão, a revisão sistemática mostrou baixa evidência para a associação entre estresse no trabalho e DTM, dado o número limitado de artigos e várias deficiências metodológicas. O estudo transversal evidenciou o efeito da pandemia na distribuição das variáveis na amostra em 2020, assim como uma maior resolutividade para mulheres, dentistas e demandas associadas à odontologia no mesmo período.

Palavras-chave: Dor facial. Articulação temporomandibular. Transtornos da articulação temporomandibular. Telemedicina. Telessaúde.

ABSTRACT

Occupational Stress in Temporomandibular Dysfunctions and Resolution of Teleconsultings in Orofacial Pain in Brazil

Temporomandibular dysfunctions (TMD) comprise a heterogeneous group of musculoskeletal conditions that reach the face in their masticatory structures, causing functional limitation or pain that makes up a category of orofacial pain. They have multifactorial etiology and are a public health problem. In turn, asynchronous teleconsulting in health aims to clarify health problems referred by health professionals to telehealth, including, among various aspects, the diagnostic and clinical procedures. With the advent of the COVID-19 pandemic, the service gained a new dimension, potentially remaining a relevant post-pandemic tool. The present work used two methodological approaches. The first aimed to develop a systematic review on the relationship between work stress – a stress category – and TMD. Searches were performed in Pubmed, Scopus, Web of Science, Lilacs, Embase, Google Scholar, and Opengrey databases. In addition, an analysis of the original articles' methodological quality and their association measures was carried out. By a cross-sectional study, the second evaluated the resolution of asynchronous national dental teleconsultations of the Telessaúde Brasil Redes Program. The secondary database of the Telehealth Results Monitoring and Evaluation System (SMART, in the Portuguese acronym) from 2019 to 2020 (before and after the COVID-19 pandemic) was used. The dichotomous variable “If referral to secondary care was avoided” was considered the outcome, compared with sex and professional covariates of the users, in addition to categories of the claims. A descriptive data analysis was developed using frequency data and a negative binomial regression model to estimate the unadjusted and adjusted prevalence ratios (PR) with the corresponding 95% confidence interval. As a result of the systematic review, 12 of 602 original articles were selected. Half found an association between work stress and TMD; ATM sounds (a DTM signal) and stress at work were associated only in a population of musicians. In addition, only three studies used validated tools for both stress and TMD. As for the cross-sectional study, a total of 2,629 teleconsultations were evaluated, of which 1,982 refer to 2019 (75.4%). In 2019, 1,522 (76.8%) avoided referral to secondary care, and in 2020, 373 (57.7%) did so. Dentists (33.1%) and physicians (55.1%) made up the majority of claimants, and dental doubts (39.6%) and “others” (58%) were the most frequent. In conclusion, given the limited number of articles and several methodological deficiencies, the systematic review showed minimal certainty of the evidence for the association between work stress and TMD. The cross-sectional study showed the effect of the Pandemic on the distribution of variables in the sample in 2020, as well as a higher resolution for women, dentists, and doubts associated with dentistry in the same period.

Keywords: Facial pain. Temporomandibular joint. Temporomandibular joint disorders. Telemedicine. Telehealth.

LISTA DE ABREVIATURAS E SIGLAS

ATM	Articulação Temporomandibular
APS	Atenção Primária à Saúde
CIAP-2	Classificação Internacional de Atenção Primária, 2 ed.
CID-10	Classificação Internacional das Doenças-10
DC/TMD	*Diagnostic Criteria for Temporomandibular Disorders*
DSS	Determinantes Sociais de Saúde
DTM	Disfunção Temporomandibular
IBGE	Instituto Brasileiro de Geografia e Estatística
GRADE	*Grading of Recommendations, Assessment, Development and Evaluation*
MRP	Monitoramento Remoto do Paciente
OMS	Organização Mundial de Saúde
PROSPERO	*International Prospective Register of Systematic Reviews*
RDC/TMD	*Research Diagnostic Criteria for Temporomandibular Disorders*
SARS-CoV-2	Síndrome Respiratória Aguda Severa pelo Coronavírus 2
SMART	Sistema de Monitoramento e Avaliação dos Resultados do Telessaúde
SPSS	*Statistical Package for Social Sciences*
SUS	Sistema Único de Saúde
TI	Tecnologia da Informação
3Q/TMD	*Three Screening Questions for Temporomandibular Disorders*

SUMÁRIO

1 INTRODUÇÃO

1.1 A dor orofacial e as disfunções temporomandibulares

Disfunções e dores musculoesqueléticas, em geral, têm se associado a condições laborais e estão entre as doenças mais relacionadas ao trabalho (HEALTH AND SAFETY EXECUTIVE, 2018), ao lado de transtornos da ansiedade, estresse e depressão. Essas condições geram sofrimento e perdas consideráveis de horas laborais. Embora não haja dado agregado similar disponível, a situação no Brasil aparentemente não é diferente e vem preocupando o Ministério da Saúde (BRASIL, 2012).

A dor orofacial é uma forma frequente de dor percebida na face e/ou cavidade oral, podendo ser causada por doenças ou distúrbios das estruturas regionais, disfunção do sistema nervoso ou por influência de fontes distantes (IASP, 2016). As disfunções temporomandibulares (DTM) dolorosas são um subgrupo importante das dores orofaciais. As DTM são reconhecidas como um grupo heterogêneo de condições musculoesqueléticas que atingem a face em suas estruturas mastigatórias, englobando alterações que envolvem as articulações temporomandibulares (ATM), causando limitação funcional ou dor (OHRBACH & DWORKIN, 2016).

A DTM dolorosa é registrada como a maior causa de dor não dentária na região orofacial (GREENE, 2010) e é a dor crônica mais prevalente nesta região (MANFREDINI *et al*., 2011; PROGIANTE *et al.*, 2015). Há considerável variação na faixa de prevalência de sinais e sintomas de DTM em estudos epidemiológicos (de 3% a 80%), devido a extensas variações nos critérios metodológicos empregados (FERREIRA; SILVA; FELÍCIO, 2016; NASSIF; AL-SALLEEH; AL-ADMAWI, 2003). Sabe-se, entretanto, que a DTM é mais frequente em adultos/adultos jovens, entre 20 e 50 anos (MACFARLANE *et al.*, 2002, MANFREDINI *et al*., 2011) e em mulheres em relação aos homens (de 2 a 3:1) (BAGIS *et al.,* 2012; BUENO *et al*., 2018; MANFREDINI *et al*., 2011; SCHMID-SCHWAP *et al*., 2013). Assim como as dores crônicas em geral, as DTM são definidas mundialmente como um problema de saúde pública (CROFT; BLYTH; Van der WINDT, 2010). Isso tudo reforça a importância de mais estudos sobre sua prevalência, suas formas de tratamento e possíveis fatores etiológicos.

Em relação à etiologia das DTM, de forma geral, a ciência atual não mais legitima fatores mecânicos ou anatômicos, a exemplo da oclusão dentária, como essenciais (MANFREDINI, 2017). O bruxismo, definido como “uma atividade muscular mastigatória repetitiva caracterizada pelo apertamento ou o ranger de dentes e/ou o ato de tensionar ou movimentar a própria mandíbula em vigília ou no sono,” é considerado um fator de risco para as DTM. Historicamente reportado como a principal causa para a condição citada, seu papel vem sendo gradualmente questionado e reelaborado. Atualmente é incluído no campo comportamental, não sendo considerado uma patologia em si, mas sim - como já elencado - um fator de risco para outras patologias (LOBBEZOO *et al*, 2018). Outras variáveis de contexto neurológico ou psicossocial passam a compor os possíveis candidatos para a geração e o agravamento da dor temporomandibular (JOKUBAUSKAS *et al*., 2018; MANFREDINI *et al*., 2015; RAPHAEL *et al*., 2012), como: ansiedade (DE LUCENA *et al*. 2012), estresse psicológico (ALKHUDHAIRY *et al*. 2018), macro ou micro trauma (este último referindo-se a comportamentos como o do bruxismo) (NISHIYAMA *et al*. 2012), configuração genética (SMITH *et al*., 2013), distúrbios do sono (VEIGA, 2013) e presença de outras dores crônicas, como cefaleias (ALKHUDHAIRY *et al*. 2018).

A padronização do diagnóstico em DTM ainda é um tema bastante debatido e que passou por muitas discussões e modificações a partir da década de 1990. À época, foi elaborado o *Research Diagnostic Criteria for Temporomandibular Disorders* (RDC/TMD) – ou Critérios de Diagnóstico em Pesquisa para Desordens Temporomandibulares, que prenunciou o atual *Diagnostic Criteria for Temporomandibular Disorders* (DC/TMD) – ou Critérios de Diagnóstico para Desordens Temporomandibulares: Protocolo Clínico e Instrumentos de Avaliação, na sua versão em português (OHRBACH, 2016). Seus amplos recursos compõem um conjunto de instrumentos e orientações validados para o mais acurado e confiável diagnóstico das diversas patologias envolvidas nas DTM, por via da anamnese, de exames físicos, laboratoriais e de imagem. A versão atual é destinada ao uso em ambientes clínicos e de pesquisa aplicada (SCHIFFMAN, et al., 2014).

Embora reconhecido como uma das fontes de informação e orientação para o diagnóstico em DTM mais confiável e abrangente, o DC/TMD é extenso e complexo, o que dificulta sua utilização em pesquisa com grandes amostras.

Atualmente, como instrumento metodológico simples e eficaz, o autorrelato de saúde tem se provado útil, confiável e válido como medida de resultado em pesquisas e começa a ser mais utilizado para as DTM, colaborando com sua investigação epidemiológica (IODICE *et al*, 2019; SANTIAGO & RAPHAEL, 2018).

O próprio DC/TMD oferece instrumentos simples como o *TMD Pain screener*, ou “Triagem da Dor por DTM” - na versão em português – um questionário com apenas três itens preliminares para avaliação da dor nos últimos 30 dias (GONZALES *et al*., 2011). Ele precede um mais abrangente *Symptom Questionnaire* - ou Questionário de Sintomas do DC/TMD, no mesmo documento, incorporando cinco domínios; Dor; Dor de Cabeça; Ruídos Articulares, Travamento Fechado da Mandíbula e Travamento Aberto da Mandíbula. Outra opção oferecida pelo DC/TMD são os questionários funcionais encontrados na seção dedicada ao “Eixo II,” que aborda fatores psicossociais e incapacidade relacionada à dor. Um exemplo é a *Jaw Functional Limitation Scale* ou Escala de Limitação Funcional Mandibular, nas versões de 8 ou 20 itens (OHRBACH, LARSSON & LIST, 2008).

Outros instrumentos simplificados foram validados a partir do DC/TMD, como o *Three Screening Questions* (3Q/TMD), ou “três perguntas de triagem (3Q/DTM)” (LÖVGREN *et al*., 2016). Ele foi desenvolvido para um banco de dados de uma localidade na Suécia, e é composto por duas questões que abordam a dor frequente na região temporomandibular e uma questão para restrição ou travamento frequente da ATM. O objetivo é uma identificação preliminar de adultos com diagnóstico de DTM mais graves e comprometimento funcional do sistema mastigatório.

1.2 Trabalho e saúde

O trabalho, uma atividade de extrema importância nas sociedades humanas, pode tornar-se uma fonte de estresse e doenças a depender de sua natureza, de seu contexto geral e de condições específicas. Mundialmente, os desafios da globalização, o advento da tecnologia de informação, a automação e as rápidas mudanças nas exigências de contratação e nas categorias profissionais disponíveis no mercado têm levado os indivíduos ao estresse e a doenças crônicas (SIEGRIST & LI, 2018). A interação entre os fatores do ambiente do trabalho, suas exigências e questões individuais tais como aspectos genéticos ou condições

sociais constituem um ponto comum entre os vários modelos propostos para o entendimento do estresse ocupacional (REIS, FERNANDES & GOMES, 2010). Segundo o Instituto Brasileiro de Geografia e Estatística (IBGE, 2019, p.27), “trabalho em ocupação” significa:

> Trabalho remunerado em dinheiro, produtos, mercadorias ou benefícios (moradia, alimentação, roupas, treinamento etc.) na produção de bens e serviços; ou trabalho sem remuneração direta ao trabalhador, realizado em ajuda à atividade econômica de membro do domicílio ou parente que reside em outro domicílio, que recebe em conjunto a remuneração pelo trabalho.

O estresse no trabalho (estresse ocupacional) é definido como um processo em que o indivíduo percebe demandas do trabalho como estressores, os quais, ao exceder sua habilidade de enfrentamento, provocam no sujeito reações negativas (PASCHOAL & TAMAYO, 2004). Embora o fator estresse geral tenha sido bastante explorado em pesquisas anteriores, o estresse ocupacional é muito pouco abordado em relação às DTM (GAWADE & VARDHARAJULU, 2019). Alguns estudos examinaram atividades diretamente ligadas à ação muscular orofacial, como a de músicos de instrumentos de sopro (NISHIYAMA, 2016, VAN SELMS, 2019), ou atividades que se relacionem a posturas antifisiológicas, como para violinistas (AMORIM, 2016, SANTOS, 2017, VAN SELMS, 2019). Outros estudos avaliaram as DTM em profissionais de enfermagem (POZZEBON, 2016), professores universitários (TAVARES, 2013), cirurgiões-dentistas e trabalhadores da indústria de tecnologia (EMODI *et al*., 2015) e em relação a condições gerais de trabalho, como turnos de trabalho e carga horária semanal (HAN, 2018). A dor crônica por DTM é relatada como fator de prejuízo para o desempenho no trabalho (SUVINEN *et al*., 2004). Em todos os casos, os resultados indicaram associação significativa do estresse no trabalho com sinais e sintomas das DTM. O bruxismo, adicionalmente, também parece estar conectado a condições mais estressantes de trabalho (MARÍN, 2019), e a própria inatividade ou a desocupação se mostra bastante associada a várias categorias de transtornos psíquicos e dores crônicas (GILADI, 2015, ZECHMANN & PAUL, 2019).

O Brasil enfrenta um longo período de crise econômica e mudanças demográficas em sua população, com potencial de modificação de hábitos,

agravamento do desemprego e alteração na prevalência de categorias profissionais disponíveis no mercado de trabalho (GRANATO, 2018). Dada a etiologia multifatorial das DTM, nota-se a necessidade de incorporar às variáveis estudadas outras atividades profissionais que se relacionem a esta multiplicidade de fatores (especialmente as que gerem maior estresse ou pressão psicológica, seja por demandas de produção, exposição a ruídos, poeiras ou contaminantes, ou ainda por alterações de turnos de trabalho). A diferenciação e compreensão de todas as variáveis socioeconômicas estressoras envolvidas é complexa e desafiadora, fomentando futuras análises e investigações.

1.3 Determinantes sociais de saúde

Os Determinantes Sociais de Saúde (DSS) são conceituados como as condições de vida e trabalho dos indivíduos e de grupos populacionais para além de questões estritamente médicas, que se interrelacionam e influenciam sua situação de saúde. Em uma definição estendida da Organização Mundial de Saúde (OMS), DSS são “as condições nas quais as pessoas nascem, crescem, trabalham, vivem e envelhecem, e o conjunto mais amplo de forças e sistemas que moldam as condições da vida cotidiana” (PAHO, 2022). Eles têm relação direta com políticas públicas e econômicas e estão na base de inequidades no estado de saúde de indivíduos e de populações. Incluem a renda suficiente e proteção social, acesso à alimentação, moradia digna, educação e inclusão social (WHO, 2022a).

As bases conceituais dos DSS foram erguidas ao longo da história, desde os postulados miasmáticos das doenças, segundo os quais essas seriam transmitidas pela inspiração de “gases” de animais e dejetos em decomposição (BUCK et al., 1988) - o que vigorou até o século XIX - passando pelo surgimento da bacteriologia, que implicava os micro-organismos na formação de patologias. Todas elas obscureceram ideias sobre influências socioeconômicas, já insinuantes à época. Por fim, nasce o reconhecimento de uma complexa multicausalidade das doenças, para além de fatores orgânicos pontuais (BUCK *et al.,* 1988; NEDEL & BASTOS, 2020).

A Conferência de Alma-Ata, no final dos anos 1970, reiterou a importância dos DSS, que teriam ainda pela frente um longo caminho de avanços e retrocessos a percorrer, em direção ao reconhecimento por governos e pela

comunidade científica global (BUSS & FILHO, 2007). Uma Comissão para os Determinantes Sociais da OMS foi criada e liderada em 2005 por Michael Marmot (MARMOT, 2005), institucionalizando a importância dos determinantes sociais no contexto do processo saúde/doença de países e populações. Em 2010, a OMS forneceu um “Quadro Conceitual para Ação em Determinantes Sociais da Saúde," revendo as três principais teorias não excludentes da determinação social em saúde: produção social da doença/economia política da saúde, pelo efeito direto da desigualdade de renda e investimentos em saúde; abordagens psicossociais, ressaltando percepções que se relacionam a desigualdades sociais; e estruturas eco-sociais, que procuram integrar fatores individuais e coletivos, sociais e biológicos numa cadeia dinâmica, histórica e ecológica (BUSS & FILHO, 2007; WHO, 2010).

Ademais, diversos modelos teóricos foram propostos para explicar as relações entre os fatores envolvidos e as várias camadas de determinantes, sendo dois os mais conhecidos, o modelo de Dahlgren e Whitehead (DAHLGREN & WHITEHEAD, 1993) e o modelo de Didericksen e colaboradores (DIDERICHSEN, EVANS & WHITEHEAD, 2001; DIDERICHSEN, WHITEHEAD & BURSTRÖM, 2001). O primeiro dispõe, de forma mais simples e direta, os determinantes em camadas que partem do contexto individual, como idade, sexo e características genéticas, passam por um estrato intermediário de estilo de vida e comportamento, redes comunitárias e de apoio, condições de vida e de trabalho, acesso a alimentos ambientes e serviços essenciais, até o aspecto político, cultural e macroeconômico geral. O segundo é mais complexo e constrói uma estrutura que enfatiza a estratificação social e suas consequências, expondo de forma diferenciada indivíduos com posições sociais distintas aos agravos de saúde. Há necessidade de avanços nas pesquisas que apontem os DSS sobre as DTM, ou mesmo modelos de determinação social em saúde que contemplem as DTM.

1.4 Teleconsultorias assíncronas para dores orofaciais

Como uma ferramenta moderna para encurtar distâncias, otimizar e simplificar processos de trabalho em saúde, o atendimento remoto por meio de programas como o “Telessaúde” tem sido cada vez mais evidenciado e utilizado pela administração em saúde. Telessaúde designa o "uso de telecomunicações e

tecnologia da informação (TI) para fornecer acesso à avaliação de saúde, diagnóstico, intervenção, consulta, supervisão e informação à distância." O conceito é mais amplo do que se entende como “telemedicina” - que se refere à relação médico-paciente à distância - e inclui toda tecnologia usada para coletar e transmitir dados do paciente como telefones, e-mail e dispositivos de monitoramento remoto do paciente (MRP) para fins de educação em saúde ou serviços de saúde auxiliares (KICHLOO *et al*. 2020; UNITED STATES GOVERNMENT, 2021).

No Brasil, uma Comissão Permanente de Telessaúde no âmbito do Ministério da Saúde foi instituída pela portaria nº 561 de 16 de março de 2006 (BRASIL, 2006), sendo criado o Programa Nacional de Telessaúde, em 2007, pela portaria nº 35, ampliado e redefinido pela portaria nº 2.546 de 27 de outubro de 2011 (BRASIL, 2011). Suas diretrizes de atividades foram definidas novamente em 2015, por meio da Norma Técnica 50/2015 (BRASIL, 2015a) e atualmente é denominado Programa Nacional Telessaúde Brasil Redes. O programa abrange a teleconsultoria síncrona ou assíncrona (esta respondida em um período de até 72 horas) visando ao esclarecimento de dúvidas remetidas por profissionais de saúde sobre diagnósticos ou procedimentos clínicos e fornece apoio assistencial e/ou educacional aos solicitantes. (BRASIL, 2015a; HADDAD *et al*., 2012). As perguntas são enviadas por profissionais das unidades básicas de saúde e respondidas pelo teleconsultor, um profissional capacitado e de nível superior, pertencente a Núcleos de Telessaúde implantados em várias universidades públicas em diferentes estados brasileiros (BRASIL, 2015a, 2015b).

Esse recurso técnico, no Brasil e no restante do mundo, incrementa a atenção primária à saúde (APS), destacada na declaração de Alma-Ata (WHO,1978) como o principal acesso aos serviços de saúde, com potencial de abrangência e integração de todo o sistema para obtenção de melhores resultados (FORREST & STARFIELD, 1996), reduzindo demandas e custos adicionais com serviços especializados ou de emergência (GILL, 2000; WOODWARD *et al.* 2004). A priorização da APS promove também justiça social ao focar em ações e orientações simples, tempestivas e próximas à população que utiliza o serviço (CASTANHEIRA *et al.,* 2015; FORREST & STARFIELD, 1998).

O Sistema Único de Saúde (SUS) brasileiro baseia suas ações na municipalização da saúde e também traz em seu bojo os princípios da

universalidade da atenção, da integralidade, da descentralização das ações e do controle social. São diretrizes que desafiam os municípios a reorganizar seus modelos de atenção, oferecendo soluções locais baseadas nesses mesmos princípios (RONCALLI *et al*., 2016). A resolutividade da atenção primária, por sua vez, é definida como a capacidade das equipes de saúde em reconhecer as necessidades locais e ofertar ações para supri-las. O percentual de encaminhamentos para serviço especializado é reconhecido como um indicador de resolutividade, além da razão entre tratamentos concluídos e primeiras consultas odontológicas programáticas. Ele avalia encaminhamentos realizados para serviços especializados em relação aos atendimentos efetuados por profissionais de saúde. O indicador auxilia na qualificação das ferramentas de Telessaúde, conectadas às decisões clínicas e aos processos de regulação do acesso. O parâmetro esperado é de 5% a 20% de encaminhamentos para serviços especializados por mês (BRASIL, 2017).

Teleconsultorias assíncronas são, por sua vez, pouco debatidas e investigadas na Odontologia, apesar da área encontrar-se dentre as que mais demandam o serviço no campo da saúde (proporcionalmente à alta prevalência de doenças bucais na atenção primária) (BRASIL, 2006, 2011, 2015c; HADDAD, 2012). A expectativa é de crescimento dessa modalidade de serviço a partir da pandemia da COVID-19 em 2020 (KICHLOO *et al*., 2020). De relevância para incrementar as relações e trocas de informações entre os vários níveis da atenção em saude, vencendo barreiras geográficas ou de escalas de atendimento, o programa de teleconsultorias tem ainda o potencial para aprimorar o diagnóstico do câncer bucal e de dores orofaciais, reduzindo encaminhamentos desnecessários e tornando o serviço mais resolutivo e tempestivo (FIORATTI *et al*., 2020; TORRES-PEREIRA *et al*. 2013).

O serviço assistencial na área da saúde passou por grandes mudanças diante dos enormes desafios advindos da pandemia de COVID-19. A síndrome respiratória aguda severa causada pelo Coronavírus 2 (SARS-CoV-2) ou COVID-19, que se espalhou no ano de 2019 a partir da China, representa ainda um problema grave para sistemas de saúde em todo mundo, com cerca de seis milhões de mortos registrados mundialmente, até então (WHO, 2022b). Apesar de fatores intrínsecos do vírus potencialmente induzirem analgesia (como a proteína Spike, capaz de interagir reduzindo a ação do fator de crescimento endotelial

A/neuropilina-1, considerado pró-nociceptivo), o que facilitaria a transmissão da doença por indivíduos assintomáticos (MOUTAL *et al*., 2021), a dor é também relatada como um de seus sintomas.

Um outro desafio imposto pela doença é a pletora de sintomas que podem durar além do período agudo de 4 semanas e que é definida como a "Síndrome pós-Covid." Essa condição afeta múltiplos órgãos e sistemas, sendo também relacionada à dor generalizada (descrita como mialgia) e cefaleias. Embora ainda em debate e ampla investigação, é certo que a síndrome exigirá equipes de saúde multidisciplinares para seu estudo, controle e vigilância, provavelmente por longos períodos (AL-JAHDHAMI I., AL-NAAMANI K. & AL-MAWALI A., 2012; NALBANDIAN *et al*., 2021). Ao que tudo indica, os diversos recursos da Telessaúde encontrarão um campo fértil de aplicação e expansão pela frente, seja pela síndrome descrita, seja pelo impacto da pandemia de COVID-19 nos serviços de saúde, ou pelos inúmeros transtornos orgânicos e psicossociais gerados nos indivíduos afetados (ALMEIDA-LEITE; STUGINSKI-BARBOSA; CONTI. 2020). As propostas de evolução desse modelo de atendimento exigirão análises criteriosas sobre sua dinâmica, envolvendo as mais frequentes categorias de demandas e características do perfil de seus usuários.

Este estudo investigou os profissionais que utilizaram as teleconsultorias assíncronas no Brasil e suas principais dúvidas relativas às dores orofaciais quanto ao parâmetro de resolutividade do programa - envolvendo um período especialmente crítico para a manutenção de serviços de saúde como foi o da pandemia de COVID-19. Também realizou uma revisão sistemática sobre aspectos laborais nas DTM, chamando a atenção para a relevância do estudo de variáveis do trabalho associadas a um distúrbio musculoesquelético que é cada vez mais citado e investigado no contexto da saúde pública.

2 OBJETIVOS

2.1 Objetivo geral

Avaliar a associação entre estresse no trabalho e a disfunção temporomandibular, bem como descrever e identificar fatores associados à resolutividade das teleconsultorias para a dor orofacial no Brasil.

2.1 Objetivos específicos

a) Identificar as evidências sobre a associação entre o estresse no trabalho e a disfunção temporomandibular.
b) Descrever as covariáveis de sexo e profissão dos funcionários da APS e de dúvidas remetidas às teleconsultorias para a dor orofacial no Brasil, bem como analisar sua possível associação com a resolutividade do programa.

3 HIPÓTESES

Os autores assumiram com hipóteses nulas os seguintes itens:

a) Não há associação entre estresse no trabalho e a disfunção temporomandibular.
b) Não há associação entre covariáveis de sexo e profissão dos funcionários da atenção primária ou de suas dúvidas remetidas ao serviço de teleconsultorias em dor orofacial no Brasil e a resolutividade do programa.

4 MATERIAIS E MÉTODOS

4.1 Revisão sistemática (já publicada; ARANHA *et al*. 2021ª - ver Apêndice A)

A revisão sistemática abordou o tema “associação entre o estresse no trabalho e a DTM.” Uma revisão sistemática da literatura científica é um estudo secundário que reúne em um único trabalho resultados e conclusões de estudos semelhantes, avaliados criticamente segundo a metodologia utilizada e, quando possível, agregados em uma única análise estatística (a chamada metanálise). Quando bem realizada, a revisão sistemática é tida como o maior nível de evidência científica (COCHRANE BRASIL, 2019).

4.1.1 Protocolo e registro

A revisão sistemática foi registrada no *International prospective register of systematic reviews* (PROSPERO na página http://www.prisma-statement.org/Protocols/Registration.aspx; ou https://www.crd.york.ac.uk/prospero/). O relato dessa revisão sistemática seguiu o *Preferred Reporting Items for Systematic Reviews and Meta-analyses* (MOHER *et al*., 2009). Teve como orientação o “Review Manager/Cochrane” (COCHRANE COMMUNITY, 2019).

4.1.2 Pergunta de pesquisa

A pergunta original da revisão, com base no anagrama PECO – desenvolvido para pesquisas observacionais (GALVÃO & PEREIRA, 2014; MORGAN, 2018) foi: “Há associação entre o estresse do trabalho e a DTM?” **P** (do inglês *population*): Trabalhadores remunerados de qualquer categoria ou localidade, de ambos os sexos, acima de 18 anos. Exposição, **E** (do inglês *exposure*): categorias de trabalho consideradas como fisicamente ou psicologicamente estressantes ou características laborais potencialmente estressantes como carga horária laboral excessiva, alta exigência de resultados ou metas e turnos alternativos de trabalho. Comparador, **C** (do inglês *comparison*): Indivíduos pareados de outras categorias laborais em geral ou de categorias

laborais consideradas menos estressantes àquelas pesquisadas. E o resultado ou desfecho **O** (do inglês *outcome*): Diagnóstico ou sinais/sintomas da DTM.

4.1.3 Critérios de inclusão e exclusão

Foram incluídos estudos originais transversais, de coorte ou caso controle, controlados, confrontando qualquer categoria, aspecto ou característica laboral potencialmente estressante (como categorias profissionais específicas, turnos alternativos de trabalho, hierarquias rígidas de trabalho, falta de ergonomia, exigência muscular, doenças associadas ao trabalho, baixa remuneração, estabilidade/instabilidade laboral) com o diagnóstico ou sinais/sintomas de disfunção temporomandibular de natureza muscular e/ou articular.

Revisões da literatura, artigos de opinião, resumos de congressos e editoriais foram excluídos, assim como estudos com descrição insuficiente de metodologia para sua boa compreensão, considerando instrumentos de coleta, amostras e resultados. Não houve restrição da categoria de língua avaliada nem sobre data de publicação dos artigos incluídos.

4.1.4 Fontes de informação e estratégias de busca

A busca na literatura foi realizada nas bases de dados PubMed, Scopus, Web of Science, LILACS- Literatura Latino-Americana e do Caribe em Ciências da Saúde e Biblioteca Virtual em Saúde, até a data de setembro de 2020, com o objetivo de identificar e coletar o maior número possível de estudos primários elegíveis. Buscas manuais na lista de referências dos artigos incluídos, assim como uma busca na literatura cinzenta pelo meio do Google Scholar e do “Opengrey” foram também realizadas. Para referências não recuperadas, tentativas de contato com os autores foram feitas, e os resultados das pesquisas verificados para eliminação das duplicatas.

As palavras chaves utilizadas nas estratégias de busca foram, conforme a plataforma utilizada:

a) PubMed Medline (Mesh):

Temporomandibular OR Temporomandibular disorder OR temporomandibular joint OR myofascial pain dysfunction syndrome OR temporomandibular joint OR temporomandibular joint disk OR temporomandibular articular disk **AND** labor OR schedule OR work OR work load OR employee work load OR stress OR shift work sleep disorder OR staff work load OR work capacity evaluation OR tolerance, work schedule OR occupational OR occupational health OR occupational accident OR occupational dentistries OR occupational dentistry OR occupational diseases OR occupational exposures OR occupational groups OR job OR employment OR unemployment OR income OR salary OR public OR private OR professional OR worker OR students OR nursing OR nurses OR dentists OR physician OR military personnel OR school teacher OR music OR singer OR singing OR auxiliary OR auxiliaries OR service OR sector OR industrial OR comercial OR economic OR personnel OR technical OR staff OR employees OR company OR caregiver OR consumer

b) Scopus (Emtree**)**

Temporomandibular OR Temporomandibular disorder OR Temporomandibular disk displacement OR Temporomandibular articular disorder OR Muscular temporomandibular disorder OR Muscle temporomandibular disorder OR temporomandibular joint disk OR temporomandibular articular disk **AND** labor OR work OR work schedule OR work load OR employee OR work stress OR shift work sleep disorder OR staff work load OR work capacity evaluation OR tolerance, work schedule OR occupational OR occupational health OR occupational accident OR occupational dentistries OR occupational dentistry OR occupational diseases OR occupational exposures OR occupational groups OR job OR employment OR unemployment OR income OR salary OR public OR private OR professional OR worker OR students OR nursing OR nurses OR dentists OR physician OR military OR personnel OR school teacher OR music OR singer OR singing OR auxiliary OR auxiliaries OR service OR sector OR industrial OR comercial OR economic OR technical OR staff OR employees OR company OR caregiver OR consumer

c) Web of Science

1. Temporomandibular OR temporomandibular disorder OR temporomandibular pain OR temporomandibular joint OR temporomandibular

articular OR temporomandibular disk OR temporomandibular myofascial OR temporomandibular muscle

2. Labor OR schedule OR work OR work load OR employee OR stress OR shift work OR staff OR work capacity evaluation OR work schedule OR occupational OR occupational health OR occupational accident OR occupational dentistries OR occupational dentistry OR occupational diseases OR occupational exposures OR occupational groups OR job OR employment OR unemployment OR income OR salary OR public OR private OR professional

3. Worker OR students OR nursing OR nurses OR dentists OR physician OR military personnel OR school teacher OR music OR singer OR singing OR auxiliary OR auxiliaries OR service OR sector OR industrial OR comercial OR economic OR personnel OR technical OR staff OR employees OR company OR caregiver OR consumer

d) Lilacs

(temporomandibular OR "Temporomandibular disorder" OR "temporomandibular joint" OR "myofascial pain dysfunction syndrome" OR "temporomandibular joint" OR "temporomandibular joint disk" OR "temporomandibular articular disk") **AND** labor OR schedule OR stress OR **(**work OR "work load" OR "employee work load" OR "shift work sleep disorder" OR "staff work load" OR" work capacity evaluation" OR "tolerance, work schedule") OR (occupational OR "occupational health" OR "occupational accident" OR "occupational dentistries" OR "occupational dentistry" OR "occupational diseases" OR "occupational exposures" OR "occupational groups") OR job OR (employment OR unemployment) OR income OR salary OR (public OR private) OR professional OR worker OR students OR (nursing OR nurses) OR dentists OR physician OR military personnel OR school teacher OR music OR singer OR singing OR (auxiliary OR auxiliaries) OR personnel OR service OR sector OR industrial OR comercial OR economic OR technical OR staff OR employees OR company OR caregiver OR consumer

4.1.5 Seleção dos estudos

Dois autores avaliaram títulos/resumos de forma independente. Foi averiguada e constatada a adequada concordância inter-examinadores (Cohen`s Kappa=0,937). Inicialmente os títulos/resumos foram selecionados quanto aos critérios de inclusão/exclusão. Caso possuíssem informações insuficientes para uma decisão de inclusão ou exclusão, os textos completos foram recuperados para análise. Os mesmos dois autores avaliaram os textos. Discordâncias foram resolvidas através da opinião de um terceiro pesquisador sênior.

4.1.6 Extração de dados

Os dados dos trabalhos incluídos foram extraídos e registrados em uma planilha do aplicativo *Excel* pelos mesmos dois autores, que fizeram sua confirmação e os verificaram pelo menos duas vezes para assegurar a exatidão. Discordâncias entre os dois pesquisadores foram resolvidas pelo pesquisador sênior.

4.1.7 Dados extraídos

Os seguintes dados foram extraídos: nome dos autores e data da publicação, país onde o estudo foi conduzido, número de participantes, características dos participantes (sexo e idade), categoria ou característica do trabalho remunerado avaliada, desfechos quanto à presença/ausência ou intensidade da DTM ou sinais/sintomas de DTM (movimento mandibular modificado ou prejudicado, dor ou ruídos em ATM), associação/não associação entre as variáveis pesquisadas.

4.1.8 Risco de viés dos estudos incluídos

As ferramentas do *Joanna Briggs Institute* para estudos transversais foram usadas para avaliar a qualidade metodológica (JOANNA BRIGGS INSTITUTE, 2017). Para eleição das variáveis de confusão, consultou-se o DC/TMD (SCHIFFMAN, et al., 2014) e o modelo heurístico do estudo “Dor orofacial: avaliação prospectiva e estimativa de risco (OPPERA, sigla em inglês). Este último foi um estudo de coorte multicêntrico realizado com grande amostra de adultos

livres de DTM, avaliando fatores preditores fenotípicos e genéticos para o início das DTM (SLADE *et al*., 2016). Para o domínio do estresse, fatores semelhantes foram considerados. No final, os fatores de confusão mínimos selecionados para integrar a análise ajustada foram: ansiedade, depressão, sexo, idade, distúrbios do sono, dores de cabeça e doenças sistêmicas comórbidas relacionadas à dor (por exemplo, diabetes, fibromialgia ou artrite reumatoide).

4.1.9 Medidas de associação

As seguintes medidas de associação entre os resultados foram coletadas dependendo da disponibilidade: médias, desvio padrão, diferenças de média com seus respectivos desvios padrão, *odds ratio*, intervalo de confiança e valores de *p*.

4.1.10 Síntese dos resultados.

Artigos incluídos com homogeneidade metodológica são incorporados em uma meta-análise. A heterogeneidade metodológica dos artigos originais não permitiu uma análise estatística agrupada, então uma síntese narrativa dos resultados foi elaborada. A certeza da evidência para a síntese narrativa dos estudos foi investigada via *checklist* do *Grading of Recommendations, Assessment, Development and Evaluation* (GRADE). Para estudos observacionais, a certeza da evidência começa como baixa e pode ser ainda mais rebaixada devido ao risco de viés, inconsistência, indireção, imprecisão e viés de publicação. Entretanto, pode ser elevada devido à avaliação de dose-resposta, magnitude do efeito e confundidores residuais (ZHANG; AKL; SCHÜNEMANN. 2019).

4.1.11 Aspectos éticos

Revisões sistemáticas da literatura e/ou meta-análise são consideradas estudos originais, entretanto são estudos secundários. Foi observado o relato de aspectos éticos para cada estudo original analisado.

4.2 Estudo transversal (artigo submetido ao periódico – ver seção 5)

4.2.1 Fonte de informação e amostra

O estudo transversal utilizou dados secundários referentes aos núcleos de telessaúde do Programa Telessaúde Brasil Redes, no período de janeiro de 2019 a dezembro de 2020. Os núcleos de telessaúde, responsáveis pela oferta de teleconsultorias, foram implantados em universidades públicas do país, em todos os estados, à exceção do Distrito Federal (BRASIL, 2021). A coleta dos dados utilizou o banco de dados nacional do Sistema de Monitoramento e Avaliação dos Resultados do Telessaúde (SMART) e ocorreu de agosto de 2020 a setembro de 2021, envolvendo ao todo quatro pesquisadores.

A variável dicotômica “Se evitou encaminhamento para atenção secundária,” seja esta odontológica ou de outro ramo da área de saúde, foi estabelecida como o desfecho, representando a resolutividade do programa de teleconsultorias. As três covariáveis individuais selecionadas diretamente do banco de dados foram: sexo do profissional demandante da atenção primária, sua profissão e dúvidas relativas às demandas em dor orofacial pelo critério CID-10 (Classificação Internacional das Doenças-10) ou CIAP-2 (Classificação Internacional de Atenção Primária).

4.2.2 Critérios de inclusão e exclusão

Foram incluídos os itens relativos a dúvidas ou sintomas que remetessem à dor orofacial, tomando como base o “Guia para Avaliação, diagnóstico e Tratamento” da *American Academy of Orofacial Pain* (LEEUW *et al*., 2018). No caso do CID-10, as categorias advêm principalmente dos capítulos 11 (sobre problemas digestivos/bucais) e 13 (sobre problemas dos tecidos conjuntivo, ósseo e muscular). No caso do critério CIAP-2, especialmente dos componentes digestivo (D), músculo esquelético (L) e neurológico (N) (WHO, 2021a, 2021b).

Os itens propostos para o estudo são descritos abaixo:

Lista CID 10

K030 - Atrito dentário excessivo

K040 - Pulpite
K050 - Gengivite aguda
K052 - Periodontite aguda
K076 - Transtornos da articulação temporomandibular
K146 - Glossodinia
S025 - Fratura de dentes

Lista CIAP-2
D19 - Sinais/sintomas dos dentes/gengivas
D20 - Sinais/sintomas da boca/língua/lábios
H01 - Dor de ouvidos
L07 - Sinais/sintomas da mandíbula
N01 - Cefaleia
N03 - Dores da face
N89 - Enxaqueca
N92 - Nevralgia do trigêmeo
N91 - Paralisia facial/paralisia de Bell
N95 - Cefaleia tensional
R09 - Sinais/sintomas dos seios paranasais
R75 - Sinusite crónica/aguda

4.2.3 Covariáveis

Para composição das covariáveis, foram considerados em primeiro lugar o sexo do profissional da APS (masculino ou feminino). Em seguida, as categorias de trabalho desses profissionais foram divididas em seis grupos, de acordo com sua formação em relação à proximidade do tratamento da dor orofacial e/ou frequência de registro no banco de dados, a saber: Cirurgião-dentista Clínico Geral, Cirurgião-dentista Especialista, Médico Generalista, Médico Especialista, Enfermeiro, Outros (composta por pessoal administrativo, Cirurgião-dentista Auditor, Auxiliar de Saúde Bucal, Agente Comunitário de Saúde, Técnico em Radiologia e Imagiologia, Biomédico, Médico Residente, Fonoaudiólogo, Psicólogo Clínico, Fisioterapeuta, Farmacêutico em Saúde Pública, Terapeuta Ocupacional ou não informado).

Por fim, as categorias de dúvidas deram origem a três grupamentos, baseados na proximidade com a tradicional prática clínica odontológica, também coerente com critérios atualizados de classificação em dor orofacial (ICOP, 2020), destacando as dores de origem dental ou periodontal e a disfunção temporomandibular. Um terceiro grupo para “outras condições em cabeça e pescoço” representou as demandas que, embora refiram-se a estruturas da cabeça/pescoço, podem confundir a investigação odontológica e são em geral remetidos às diversas especialidades médicas (como é o caso das cefaleias e das sinusites).

Os grupos formados de dúvidas remetidas ao programa são descritos no Quadro 1:

Quadro 1 – Categorias de Dúvidas remetidas à teleconsultoria em DTM/dor orofacial

Grupo 1 Dores/condições em cavidade oral	Grupo 2 Disfunção Temporomandibular	Grupo 3 Outras dores/condições em cabeça e pescoço
D19 - Sinais/sintomas dos dentes/gengivas (CIAP)	L07 - Sinais/sintomas da mandíbula (CIAP)	H01 - Dor de ouvidos (CIAP)
D20 - Sinais/sintomas da boca/língua/lábios (CIAP)	K076 - Transtornos da articulação temporomandibular (CID)	N01 - Cefaleia (CIAP)
K030 - Atrito dentário excessivo (CID)	_	N03 - Dores da face (CIAP)
K040 - Pulpite (CID)	_	N89 - Enxaqueca (CIAP)
K050 - Gengivite aguda (CID)	_	N91 - Paralisia facial/paralisia de Bell (CIAP)
K052 - Periodontite aguda (CID)	_	N92 - Nevralgia do trigêmeo (CIAP)
K146 - Glossodinia (CID)	_	N95 - Cefaléia tensional (CIAP)
S025 - Fratura de dentes (CID)	_	R09 - Sinais/sintomas dos seios paranasais (CIAP)
_	_	R75 - Sinusite crónica/aguda (CIAP)

Nota: as teleconsultorias duplicadas no banco de dados, informações incompletas ou dados que abrangem outras questões que não a dor orofacial foram removidas.

Fonte: WHO, 2021a, caps. 11 e 13; 2021b, caps. D, L, N

4.2.4 Análise dos dados

Foi elaborada uma análise descritiva dos dados, por meio de frequência, com estratificação dos dados por ano da demanda (2019 ou 2020), para sexo e categoria profissional do demandante da atenção primária e tipo de agravo relacionado às demandas em dor orofacial (dúvidas). Além disso, construiu-se um modelo de regressão binomial negativa para estimar as razões de prevalência não ajustadas e ajustadas (RP) e o intervalo de confiança de 95% correspondente, utilizando-se o programa estatístico *Statistical Package for Social Sciences* – SPSS versão 22.0 (IBM SPSS Statistics for Windows, Armonk, NY). Tendo em vista a importância da pandemia por COVID-19 e seu impacto sobre os sistemas de saúde (SØREIDE *et al.*, 2020; KAYE *et al*., 2021), toda a análise foi feita considerando os anos de 2019 e 2020 separadamente – o período anterior e o correspondente à pandemia da COVID-19, analisando nesse contexto tendências, virtudes e limitações do serviço de teleconsultorias para dor orofacial.

4.2.5 Considerações éticas

Este estudo foi aprovado pelo Comitê de Ética em Pesquisa da Universidade Federal de Minas Gerais (UFMG), sob o parecer nº 3.662.611 (CAAE: 17400319.9.0000.5149) (Apêndice B). Para o presente estudo, não foi necessária a anuência de participantes através de um Termo de Consentimento Livre e Esclarecido (TCLE), uma vez que foram coletados dados secundários obtidos através do banco de teleconsultorias assíncronas do Telessaúde Brasil Redes. Como não se trata de um banco público, o acesso às informações foi solicitado à Coordenação-Geral de Políticas e Inovação em Saúde, Departamento de Saúde Digital e Secretaria Executiva do Ministério da Saúde, com base na Lei nº 12.527, de 18 de novembro de 2011, que regula o acesso a informações em conformidade com os princípios básicos da administração pública da União, Estados, Distrito Federal e Municípios (Apêndice C). Esta Lei considera entre outras prerrogativas informação como dados, processados ou não, que podem ser utilizados para produção e transmissão de conhecimento, contidos em qualquer meio, suporte ou formato (BRASIL, 2011). Os pacientes, solicitantes da teleconsultoria e teleconsultores tiveram suas identidades preservadas.

5 RESULTADOS E DISCUSSÃO

Esse capítulo será composto pelos dois artigos redigidos para publicação. O primeiro encontra-se publicado no periódico *BioMed Research International* (Apêndice A) e o segundo submetido ao periódico *Community Dentistry and Oral Epidemiology*, Fator de impacto 2.489; https://onlinelibrary.wiley.com/journal/16000528 - ver normas de submissão no Apêndice D).

5.1 Artigo 1

Association between stress at work and temporomandibular disorders: a systematic review

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Abstract

Temporomandibular disorders (TMD) have been traditionally associated with psychosocial factors; however, occupational stress as a factor related to TMD has not been adequately assessed in the literature. The aim was to investigate the association between stress at work and TMD on adult paid workers. An electronic search included PubMed, Scopus, Web of Science, Embase, and LILACS databases. Manual searches in the included articles' reference and gray literature were performed. There were no restrictions regarding language or publication period. The inclusion criteria comprised observational studies with paid workers of any category, of both sexes, above 18 years old, assessing occupational stress/stress or distress, and TMD as diagnosis or isolated signs and symptoms. Methodological quality was evaluated using Joanna Briggs tools. We narratively assessed the evidence using the Grading of Recommendations, Assessment, Development and Evaluation (GRADE) approach. We collected 12 studies. 50% reported a positive association between stress and TMD diagnostic across various job categories. On the other hand, TMJ sounds (a TMD sign) and work stress were associated only in a musicians' population. However, the shortage of eligible articles and the methodologic limitations provided a very low certainty of the evidence; only 4 of the studies used validated tools for both stress and TMD (2 reporting positive association). The association between stress and TMD is inconclusive by the available data. In the future, we expect more robust epidemiologic studies addressing these relevant aspects.

Keywords

Temporomandibular disorder; Psychological stress; Occupational health; Work stress.

Introduction

Temporomandibular disorder (TMD) is a condition of pain or musculoskeletal dysfunction that affects the face in its masticatory structures and encompasses a group of changes involving the temporomandibular joints. It represents the primary cause of non-dental pain in the orofacial region [1], and it is the most prevalent chronic pain [1,2]. Like chronic pain in general, TMD is defined as a clinical and public health problem [3]. Due to extensive variations in the methodological criteria employed, there is considerable variation in the prevalence of TMD signs and symptoms in epidemiological studies (from 3% to 80%) [4,5]. The TMD diagnostic concepts represent a matter of debate over the past decades, evolving from sparse TMD signs and symptoms to the well-structured Research Diagnostic Criteria for Temporomandibular Disorders (RDC/TMD). Its upgraded version is the Diagnostic Criteria for Temporomandibular Disorders (DC/TMD) Consortium Network, a worldwide effort to improve and standardize the diagnostic tools for research and clinical purposes [6]. Despite the historical lack of robust diagnostic standards, TMD is considered more frequent in adults or young adults, between 20 and 50 years old [1,4] and in women compared to men (from 2 to 3:1) [7-10].

Work environment and work conditions are historically known as disease-related factors, particularly in the face of job instabilities and the high level of performance demands that characterize the current globalized market. The fast changes in technology and local economic conditions present new challenges to work human resources worldwide. Accordingly, paid work involves several situations and aspects that interact with the social determinants of health [11].

The relationship between TMD and stress is well established and widely explored in the literature [12-14]. However, the connection between work factors or work stress in TMD is not sufficiently investigated, and hence, poorly understood and determined. Work stress is a category of psychological stress, defined as a process in which the individual perceives work demands as stressors, which, when exceeding their coping skills, provoke adverse reactions in the subject [15]. High levels of demands, lack of resources, social support [16-18], and low psychological detachment from work [19] stand out as work risk stressors. On the other hand, anxiety is the anticipation of future threats; it is distinguished from fear, the emotional

response to a real or perceived imminent threat [20,21]. The distinction between stress and anxiety is subtle. Both are emotional responses with similar coping mechanisms, but an external trigger typically causes stress. Anxiety is defined as persistent worries, even in the absence of an objective stressor [22]. The limited number of studies dedicated to occupational stress and TMD frequently dealt with physical aspects of work, particularly those directly affecting the orofacial region [23-25]. The TMD field has shifted from etiological and therapeutic mechanical centered to a broader biopsychological disease model, including medical, social, and psychological variables. This change implies that relevant demographics and socioeconomic factors should be taken into account in current research efforts [26]. The psychological literature still reports the term "distress" (a particular categorization of stress, in opposition to "eustress") as a negative counterpart, the most known type. Distress is the aversive, negative state in which coping and adaptation processes fail to return an organism to physiological or psychological homeostasis [27,28]. Moreover, the correct identification of etiologic factors will enable the appropriate and comprehensive dental care planning for TMD. This review evaluates the scientific evidence on the relationship between stress/distress/work stress and TMD. Hence, the aim of this study was to investigate the association between stress at work and TMD on adult paid workers.

Materials and Methods

This systematic review followed the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) checklist [29]. The review protocol is registered at the International Prospective Register of Systematic Reviews (PROSPERO) under the registration number #CRD42020186274.

The review question was: Is there an association between stress at work and temporomandibular disorder among adult workers?

The question mirrors the following PECO framework for observational study development:

Population (P): professional or semi-professional (part-time) adult workers.

Exposure (E): high levels of stress/distress or stress at work.

Comparator (C): no stress/distress/stress at work or lower stress/distress/stress level at work.

Outcomes (O): TMD or isolated signs/symptoms of TMD.

Eligibility Criteria

The inclusion criteria were as follows: observational studies (cross-sectional, case-control, and cohort studies) evaluating the association between occupational stress, stress or distress among job/work/profession groups and TMD categories, or TMD signs and symptoms; assessing paid professional or semi-professional (part-time) workers of any type or geographic location, from both sexes and above 18 years old. There was no limit on language and period. The search was updated until March 19th 2021. If any manuscripts were written in languages other than English, Spanish or Portuguese were identified, proofreading would be accessed for a professional translation.

The exclusion criteria were: studies assessing non-paid workers, studies without TMD measures or their signs and symptoms, surveys that assess other psychological disorders ruling out stress/distress, or disallowing the analysis of the association between the variables.

Search Strategy

We searched the following electronic databases from inception up to September 2020: Medline through PubMed, Scopus, Web of Science, Embase through Ovid; Latin American and Caribbean Health Sciences (LILACS) through the Virtual Health Library (BIREME). We also searched gray literature through OpenGrey and Google Scholar; these latter limited to the first 100 listed results. We hand searched the list of references of included studies. Details of the search strategies are listed in supplementary file 1.

Study Selection and Data Extraction

The list of references was retrieved from Endnote web (myendnoteweb.com) (Clarivate Analytics, PA, USA). Two independent examiners screened titles and abstracts and selected papers in the forthcoming stages (Cohen's Kappa=0.937). Titles and abstracts that met the eligibility criteria were selected for full-text analysis. A second screening was independently performed based on the full texts. A third examiner was consulted to solve any eventual disagreement.

A spreadsheet was created at the Excel program for data extraction (supplementary file 2). The independent reviewers tested the form. Data regarding the name of the authors, date of publication, study settings, population characteristics (country, sample size, dropouts, control group, occupational stress/stress reports, diagnosis of TMD disorders, modified or impaired mandibular movement, and TMD joint pain or joint sounds registered as TMD signs/symptoms) were collected. The assessment of muscle pain and joint disorder was performed accordingly to the Diagnostic Criteria for Temporo-mandibular Disorders (DC / TMD).

Quality Assessment of Original Articles

Joanna Briggs Institute's tools for cross-sectional studies were used to assess the methodological quality [30].

For the included cross-sectional studies, the following criteria were considered: inclusion criteria, study subjects, exposure measures, objective and

standard criteria, confounding factors and strategies to deal with confounding factors, outcomes measures, and appropriate statistical analysis.

For electing the essential confounding variables, we consulted the DC/TMD [6] and the heuristic model of "The Orofacial Pain: Prospective Evaluation and Risk Assessment (OPPERA)". The latter is a multicenter ongoing cohort study from a large base of TMD-free adults, assessed in detail several years for phenotypic and genetic predictor factors of first-onset TMD [9]. For the stress domain, similar confounding factors were considered [31-36]. In the end, the minimum appropriate confounding factors selected to integrate the adjusted analysis were: anxiety, depression, gender, age, sleep disturbances, headaches, and comorbid systemic diseases related to pain (e.g., diabetes, fibromyalgia, or rheumatoid arthritis).

Data synthesis

For the final narrative synthesis, we used the Grading of Recommendations, Assessment, Development, and Evaluation (GRADE) to assess the certainty of the evidence for narrative synthesis [37]. For observational studies, the certainty of the evidence starts with low, and it can be rated down due to risk of bias, inconsistency, indirectness, imprecision, and publication bias. The evidence was further assessed for dose-response, the effect's magnitude, and residual confounders that could rate up the certainty [38].

Results

The initial search retrieved 602 studies. The search in the reference lists of articles and gray literature provided three additional items. After removing duplicates and the first screening of titles and abstracts, 577 articles remained. Thirty studies were full text analyzed. Fourteen were excluded because they were cross-sectional inquiries for assessing TMD prevalence in professional categories without reporting stress. Four studies were excluded because they did not allow an association analysis between TMD/signs/symptoms and stress. Finally, 12 studies were included in the systematic review (Figure 1) [39-50].

Quality Assessment of Original Articles

The implementation of Joanna Briggs Institute's tools for cross-sectional studies yielded for each domain investigated. From the eight criteria evaluated, that with the highest adherence was about objective, standard criteria for measurements (item 4) and that with the lowest adherence to JBI evaluation was about confounding factors identification (item 5) (supplementary file 3).

Narrative synthesis

Due to the significant heterogeneity among studies, different types of workers assessed, various diagnosis tools for DTM/stress, and distinct statistical methods, a narrative synthesis was performed instead of a meta-analysis to evaluate the association between stress at work and TMD. From the 12 studies, 11 presented the diagnosis of TMD [39-44,46-50], and 1 evaluated only the signs and symptoms of TMD [45]. Two manuscripts evaluated both diagnosis and signs and symptoms of TMD (Table 1) [41,50]. To perform meta-regression, at least a sufficient number of studies in the model is necessary [51]. Few studies informed about participants with or without TMJ (n=5), and other few informed about low and high levels of stress (n=5). None had similar work class categories. Therefore, a meta-regression analysis with regards to stress and TMJ was not feasible too.

The narrative synthesis showed that six studies found a positive association between stress and the diagnosis of TMD [39,40,43,46,47,49]. The highest association strength was an OR= 6.03; 95% CI 2.51–15.33 [43]. However, among these studies, only 2 used validated scales for stress [43,49], 3 used nonvalid

scales [40,46,47], and one study [39] was not clear as the scale used for stress. Concerning the TMD, 4 used validated scales [40,43,47,49], and 2 did not [39,46]. The work categories varied from dentists, high-tech workers [40], employees of Finish Broadcasting Company [39], Asian Military Personnel [49], full-time female workers [47], information technology professionals [46], and violinists (Table 1) [43].

On the other hand, five articles reported no association between stress and the diagnosis of TMD [41,42,44,48,50] - 2 studies using a validated scale for stress [44,48], and 3 using nonvalid scales [41,42,50]. All of them used TMD valid instruments. The work categories varied from vocalists [41], vocalists, upper strings instrumentalists (violin, viola) and wind instrumentalists [50], nurses [48], industrial workers [44], and electronic industry workers [42] (Table 1).

For the studies with TMD signs and symptoms, one found an association with stress (for joint sounds) [50], and two did not [41,45]. All used an original validated TMD scale but nonvalid stress scales. The work categories varied from vocalists [41], upper strings instrumentalists, and wind instrumentalists [50], and workers from call centers [45] (Table 1). The use of validated scales has provided a different associative rate among studies. From the twelve evaluated manuscripts, only four articles employed validated tools for both variables stress and TMD. From this subgroup, 2 found an association [43,49], and 2 did not find it [44,48].

In summary, from the 12 articles, 7 found an association between TMD diagnostic/signs and symptoms and the stress [39,40,43,46,47,49,50] and 5 did not [41,42,44,48,50]. The evidence's certainty was very low (Table 2), rated down due to the risk of bias, inconsistency, indirectness, and publication bias. There were very serious problems of risk of bias. All studies did not adjust for the selected confounders. Seven out of 12 papers used non-validated scales for stress [40-42,45-47,50] and 2 used nonvalid scales for TMD [39,46], which means not using a validated method to measure the exposure or the outcome. There were very serious problems due to indirectness as the evidence is from some types of workers, with limited applicability to all workers. The majority of the evidence was from studies that evaluated stress at work. Only two studies assessed occupational stress with specific questionnaires [43,48]. The certainty of the evidence was rated down due to publication bias. According to the GRADE approach, publication bias is strongly suspected for observational studies as registries are non-mandatory [52].

PRISMA 2009 Flow Diagram

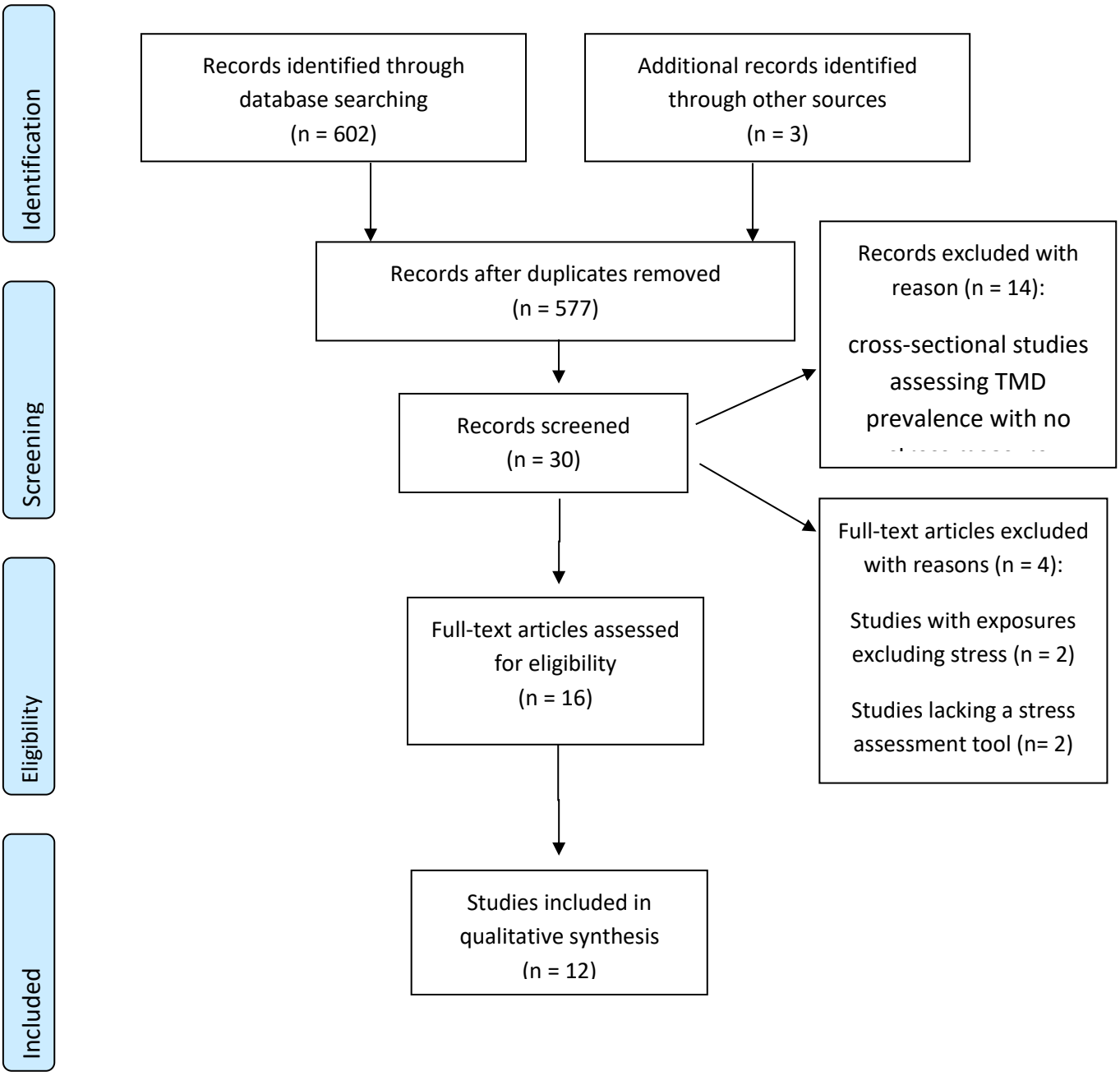

FIGURE 1 - Flow chart showing the criteria of articles search and selection (Adapted from PRISMA)

TABLE 1 - **Main descriptive features of selected studies (n = 12)**

Author, year, country	Sample size (final)	G1 (n/%)	G2 (n/%)	G3 (n/%)	G4 (n/%)	G5 (n/%)	Stress: Diagnostic tools, validation	TMD: Diagnostic tools, validation	Results	Conclusion
Rantala et al., 2003. Finnish	1339	Employees of a Finish Broadcasting Company with low perceived stress (1020/76%)	Employees of a Finish Broadcasting Company with high perceived stress (316/24%)				Occupational Stress Questionnaire (OSQ); It is not possible to check the validity of the stress scale.	TMD painless symptoms scale; It was not possible to evaluate the diagnosis validity.	High perceived stress group (50 TMJ-related painless symptoms out of 316) Low perceived stress group (75 TMJ-related painless symptoms out of 1020) (Chi-square test; p<0.001)	There was an association between stress and TMJ-symptoms.
Nishiyama et al., 2012. Japan	2203	Electronic industry workers without TMD (1841/84%)	Electronic industry workers with TMD (362/16%)				Items 5–8 for psychosocial factors, including stress; variable is not validated.	4-items questionnaire screening for patients with TMD-related symptoms (TRS).; validated diagnosis.	Stress level and TMD were not associated after logistic regression analysis. No Odds Ratio was presented for the association between stress level and TMD.	There was no association between stress level and TMD.
Emodi Perelman et al., 2015. Israel	140	General Occupation group (48/34%)	Dentists (44/32%)	High-tech workers (48/34%)			Self-reported stress at work; variable is not validated.	Full Axis I exam and diagnosis according to the RDC/TMD for myofascial pain; validated diagnosis.	Higher stress at work (Chi-square test; p=0.03) and myofascial pain (Chi-square test; p=0.02) for the high-tech and dentist groups compared	High-tech workers and dentists were more prone to have stress and TMD.

									with the general occupational group.	
Saruhanoğlu et al., 2016. Turkey	124	Workers from call centers with low stress (14/11%)	Workers from call centers with medium stress (33/27%)	Workers from call centers with high stress (77/62%)			The stress level of the job; variable is not validated.	Questionnaire from the RDC/TMD, axis 2. The diagnosis is validated.	Frequency of gradual mouth opening (Chi-square test; p=0.651), TMJ pain (Chi-square test; p=0.312), and TMJ noise (Chi-square test; p=0.944) were similar between the stress group levels (Chi-square tests).	There was no relation between TMD signs and symptoms and stress in call center employees.
Martins et al., 2016. Brazil	104	Industrial workers with less stress (98/94%)	Industrial workers with more stress (6/6%)				Social Readjustment Rating Scale – SRRS; variable is validated.	Fonseca Anamnesis Index; outcome is validated.	There were 34 workers with TMD out of 98 with less stress and 3 workers with TMD among 6 with high-stress levels (Fisher Exact Test, p=0.663).	There was no association between stress and TMD.
Amorim & Jorge et al., 2016. Portugal	93	Violinists least anxious/stressed (46/49%)	Violinists most anxious/stressed (47/51%)				Kenny Music Performance Anxiety Inventory for anxiety and psychological distress; variable is validated.	Fonseca Anamnestic Questionnaire: the outcome is validated.	Music Performance Anxiety was associated with TMD scores (OR= 6.03; 95% CI 2.51–15.33) in the final logistic regression model.	Anxiety and distress were associated with TMD.
Amalina et al., 2018. Indonesia	92	Nurses without TMD (37/40%)	Nurses with TMD (55/60%)				Expanded Nursing Stress Scale (ENSS); variable is validated.	ID-TMD questionnaire, from RDC/TMD: the outcome is validated.	There was no association between TMD and the scores of ENSS: Death and dying (Mann-Whitney U Test; p=0.177); Conflict with physicians (Independent t-test; p=0.155);	TMD was not associated with work stress among nurses in a type C Indonesian private hospital.

									Inadequate preparation (Mann-Whitney U Test; p=0.521); Problems with peers (Mann-Whitney U Test; p=0.377); Problems with supervisors (Independent t-test; p=0.107); Workload (Independent t-test; p=0.091).	
Gayathri et al., 2018. India	153	Software companies and IT professionals without stress (46/30%)	Software companies and IT professionals with stress (107/70%)				A self-administered online questionnaire for General stress symptoms; variable is not validated.	Self-admin. online questionnaire for TMD signs/symptom; outcome is not validated.	Stress level and TMD (Pearson's Chi-square test; p<0.005). The was no information on the frequencies of TMD between the groups.	There was an association between stress and TMD.
Han et al., 2018. South Korea	1612	Full-time female workers with low stress (1049/65%)	Full-time female workers with high stress (563/35%)				Self-reported stress; the variable is not validated.	TMD screening questions according to American Academy of Orofacial Pain (AAOP) and RDC/TMD; the outcome is validated.	There were 108 workers with TMD out of 1049 with less stress and 99 workers with TMD among 563 with high-stress levels (Chi-square test, p<0.001).	There was an association between high stress and TMD among female workers.

Van Selms et al., 2019. Netherland	515	Amateur/semi-professional musicians for whom loading of the masticatory system is not required (209/40%),	Amateur/ semi-prof. vocalists (306/60%)				A single question about the overall amount of stress experienced during the last 30 days (NRS 0-10); variable is not validated.	Symptom Questionnaire (SQ) of the DC/TMD; validated diagnosis.	No association in the final multiple regression model for both TMD pain and TMJ sounds. No odds ratios were presented for the association between stress level and TMD and TMJ sounds.	Stress level was not associated with both TMD pain and TMJ sounds.
Tay et al., 2019. Singapore	2043	Asian Military Personnel without TMD (1301/64%)	Asian Military Personnel with TMD (742/36%)				Stress subscale of DASS-21; variable is validated.	Symptom Questionnaire (SQ) of the DC/TMD; outcome is validated.	The mean values of DASS-21 stress subscale scores were 1.95 (SD=2.85) and 3.29 (SD=3.82) among those without and with TMD, respectively (Mann-Whitney U test; p=0.001)	There was an association between stress and TMD.
Van Selms et al., 2020. Netherland	1461	Control: other instrumentalists (208/15%)	Woodwind (371/25%)	Brass (300/20%)	Upper strings instrument alists (276/19%)	Vocalists (306/21%)	Single question: "How much stress did you experience in daily life during the last 30 days?" Variable is not validated.	Symptom Questionnaire (SQ) of DC/TMD; the outcome is validated.	No association in the final multiple regression model for TMD pain. There is an association between TMJ sounds and stress (OR 1.09; 95% CI (1.02-1.16; p=0.009)	There was an association between TMJ sounds and performance stress.

TABLE 2–The analysis of certainty of the evidence. Imported from GRADEpro Guideline Development Tool (GDT) (https://gdt.gradepro.org/app/#projects)

Certainty assessment							Impact	Certainty	Importance
№ of studies	Study design	Risk of bias	Inconsistency	Indirectness	Imprecision	Other considerations			
12	observational studies	very serious [a]	very serious [b]	very serious [c]	not serious	publication bias strongly suspected [d]	Seven studies found an association between stress and DTM or TMD signs and symptoms, and five studies found no association.	⊕◯◯◯ VERY LOW	

CI: Confidence interval

a. Twelve studies did not adjust for the confounders. Observational studies are at risk of bias because of differences in prognosis in exposed and unexposed populations (Guyatt et al., 2011//guidelines 4) **b.** There was great heterogeneity of instruments used for stress and TMD: 7 out of 12 studies used non-validated scales for stress (Nishiyama A et al., 2012; Perelman et al., 2015; Saruhanoğlu et al., 2016; Han W et al., 2018; M G et al., 2018; van Selms et al., 2019; van Selms et al., 2020) and 2 for TMD (Rantala et a., 2003; M G et al., 2018). Overall, only 3 articles employed valid instruments for both stress and TMD: (Tay et al., 2019; Amorim & Jorge., 2016; Amalina et al., 2018). There was inconsistency among studies findings: seven of selected articles found an association between TMD or TMD signs and symptoms and stress (Rantala et al., 2003; Perelman et al., 2015; Amorim & Jorge., 2016; Han W et al., 2018; M G et al., 2018; Tay et al., 2019; van Selms et al., 2020), and 5 did not find an association (Nishiyama et al., 2012, Martins et al., 2016., Amalina et al., 2018, van Selms et al., 2019; van Selms et al., 2020). **c.** The evidence is from some types of categories of workers, with limited applicability to all workers. The majority of the evidence is from studies that evaluated stress in general, but not work stress (considered in only two studies: Amorim & Jorge (2016) and and Amalina et al. (2018).**d.** Observational studies are more prone to publication bias than RCTs or clinical trials due to the non-mandatory registration in databases (Guyatt et al., 2011/guidelines 5).

Discussion

Despite mostly manuscripts found an association between work stress and TMD, there was very low certainty about this association (below the original low certainty stipulated for observational studies). Further, there were severe problems of risk of bias. Hence, there is a combination of lack of association, inconsistencies in outcome and exposure, non-standardized scales, and low quality of the evidence in the observational studies that evaluated the association between work stress and TMD.

There was heterogeneity among included studies and instruments to measure the outcome and the exposure. The high discrepancy of association results found over articles points to a high degree of inconsistency. Differences in the diagnosis criteria and the exposure could result in different findings, and this issue has been comprehensively discussed on other healthcare issues [53,54] The variation of TMD diagnostic criteria may impact its prevalence [1], and in our systematic review, it has probably changed the rate of association between stress and TMD. Anamnesis is the essence and starting point for any TMD diagnosis, represented by functional questionnaires in the research setting, whether alone or within the entire RDC/DC TMD framework, including clinical, imaging, or laboratory exams, depending on the case. Most TMD functional questionnaires applied in epidemiological surveys over time have addressed a TMD diagnostic concept that does not differ between articular and muscular TMD or yet painful and painless conditions [55-57]. Accordingly, eventual articles employing instruments for assessing specific diagnoses like painless TMD symptoms [39] myofascial pain [40] and TMD pain [41], joined, in this review, the broad category of "TMD diagnosis". In other words, they gather a generic "TMD diagnosis" entity appropriate for epidemiologic studies - in opposition to old-fashioned approaches, assessing punctual temporomandibular signs and symptoms, grouped into distinct "signs/symptoms" category for purposes of this review [45,57].

Several instruments are available to assess stress and anxiety in the research environment [58], like the “Perceived Stress Scale” [59], the “State-Trait Anxiety Inventory for Adults” (STAI-AD) [60], and the "Stress and Adversity Inventory for Adults" (Adult STRAIN) [61]. For this review purpose, which focuses on labor stress and TMD, only original studies employing questionnaires targeting stress/occupational stress or anxiety combined with stress in the same instrument were considered. As discussed before, the term "distress" was accepted and included as a corresponding of

stress [27,28]. Conceptual and methodological issues regarding work stress evaluation in its numerous aspects and TMD are anything but simple. The lack of valid and reliable diagnostic tools for distinguishing work stress from a generic concept of stress ("day life" stress) and the fragmented work stress approach seem to represent an additional critical point in many of the selected articles. They possibly account for part of the significant heterogeneity. For example, individual relevant factors related to work stress, like work team relationships and workload, were sometimes not associated with TMD [48].

The quality of the evidence, both from Johana Briggs Institute and GRADE, was low. All studies had problems in at least one Joanna Briggs tool domain. The issues included lack of confounder adjustment, valid instruments, cross-sectional study designs, the indirectness derived from the wide range of work categories assessed, and lack of a specific work stress assessment instrument accounted for it. On the other hand, it is essential to point out that RCT is not feasible, and only observational studies can be conducted. Hence the low GRADE is not necessarily a fault of the researchers of the primary studies.

Stress is connected with systemic severe and potentially fatal diseases [62-64]. Human work activity is also cited as a potential source of stress, increasing medical disease risks [18,65]. Both work stress [66] and TMD [67] affect the quality of life. Although TMD is a condition highly connected with the generic stress (daily life stress) in the literature [12-14], work stress and TMD are not traditionally investigated, unlike other musculoskeletal disorders in the workplace [68,69]. Hence, future research efforts in the temporomandibular area should be directed to particular stress characteristics or domains, like occupational stress.

Strengths and limitations

This systematic review is one of few (if not unique) to deal with work stress and TMD. Other relevant aspects are the distinction between TMD diagnostic and TMD signs and symptoms, apart from distinguishing valid from nonvalid TMD or stress assessment tools. Still, we used the Joanna Briggs Institute's tools for cross-sectional studies and the GRADE system to analyze methodological quality and the evidence's certainty, respectively. We searched in several databases, gray literature, and hand searched the included studies. However, publication bias is suspected for observational studies as registries in electronic databases are not mandatory [52].

The applicability to all work categories is limited due to limited professional classes included, which is considered indirectness. The heterogeneity was high for methodological aspects like the work category assessed, definitions of stress and TMD and assessment instruments, presence or categorization of control groups, scales' cut-off points and statistical tests. For this reason, the evidence is narratively described together with the certainty of the evidence instead of pairwise meta-analysis comparing exposure and comparison groups.

Implications for practice and research

In the future, we expect more eligible epidemiologic studies with sound methods for selecting the appropriate stress-linked work categories [65], adequate control groups, sufficient confounder adjustment in statistical analysis, and valid and reliable diagnostic tools for both work stress and TMD. Such enhancement can provide more robust and stratified outcomes for impacting both clinical decisions and public health.

Conclusion

With high methodological discrepancies concerning diagnostic standards, sample characteristics, and control group criteria, there is a very low certainty of the association between work stress and TMD, so their relationship remains inconclusive by the available data.

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Authors' contributions: This study was designed by RLBA, RCM, CCM, and MHNGA. The qualitative summary of the data was performed by RLBA, DRA, and JAMD. The analysis of the risk of bias was done by RLBA, DRA, JAMD, and CCM. The preparation of the first manuscript and the edition and review of consecutive versions was performed by RLBA, RCM, WS, CCM, and MHNGA. The supervision of the whole project was conducted by CCM, RCM, WS, and MHNGA.

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5.2 Artigo 2

Factors associated with avoiding referrals of orofacial pain cases to secondary dental care by telehealth in Brazil: a cross-sectional study on orofacial pain in 2019 and 2020

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Abstract

Telehealth uses information technology to enhance health care in distant locations. It can lower the inequalities in health services and provide additional support for primary health care professionals on diagnosis and treatment planning, qualifying the service. This study aimed to identify factors associated with avoiding referring orofacial pain cases to secondary health care by Brazilian Primary Health Care (PHC) practitioners who demanded asynchronous teleconsulting in 2019 and 2020 (the COVID-19 Pandemic burst). A cross-sectional study employed secondary databases from asynchronous teleconsulting Telehealth Brazil Networks from January 2019 to December 2020. The outcome was the dichotomous variable "If referral to secondary care was avoided." As covariates: sex, healthcare professions, and category of orofacial pain doubts. A negative binomial regression model estimated each covariate's unadjusted and adjusted PR (95%CI) and p values, stratified for 2019 and 2020. There was a difference in descriptive and factors associated with referral avoidance from 2019 to 2020. Females prevailed in both years, and the total demand decreased to a third from 2019 to 2020. The rate of resoluteness decreased by 19.1%. In 2019, specialized physicians were the most prevalent professionals, with dentists and teeth/periodontal doubts appearing the least. In 2019, nurses (PR=0.69 CI 95%0.57-0.83) and other professionals (PR=0.84 CI 95% 0.73-0.97) showed less frequency of avoiding referrals than did general dentists. In 2020, doubts about teeth/periodontal (PR=1.18 CI 95%1.06-1.32) and temporomandibular disorders (PR=1.33 95% 1.15-1.54) surpassed other causes of orofacial pain in avoiding referral, and female professionals avoided referrals more frequently than men (PR=1.24 CI 95% 1.21-1.38).

Keywords: Facial pain, telemedicine, community dentistry, public health dentistry, COVID-19

Introduction

The Brazilian National Health System (SUS) is a universal-equity-based public system. The system provides satisfactory health services and privileges primary care in an unequal and complex society.[1] In primary health care (PHC) units, the main objective is the service resolution without an unnecessary referral, in compliance with international statements that underlie the relevant role of primary health care in pursuing integration, comprehensiveness, and social justice in health.[2] This is also the primary resoluteness followed by the Brazilian telehealth program.[1] In addition, telehealth resources can be essential for disseminating knowledge on and elucidating orofacial pain issues in PHC settings. However, little is known about what determines the resolutive capacity of PHC concerning orofacial pain and TMD issues.

Telehealth uses information technology to enhance health care in distant locations. Due to its low cost and functional characteristics, telehealth can lower the inequalities in health services, reaching poorer groups within an adequate time.[3] Telehealth technology, a term that expands the scope beyond the medical area, represents an important tool available to primary care professionals, solving their doubts and increasing the service's resoluteness. This resource is paramount, especially in a country with a continental dimension and a heterogeneous health infrastructure distribution, as is the case in Brazil.[1] Expanded to the entire Brazilian territory, covering all five great Brazilian regions (North, Northeast, Midwest, South, and Southeast), the telehealth initiative of the Brazilian Ministry of Health had its activity guidelines defined in 2015.[4] The primary program goal is to support PHC professionals, providing synchronous or asynchronous teleconsulting, telediagnosis, videoconferences, and relevant second opinions. It delivers quick and valuable answers to their questions. This feature enabled a 45% reduction in referrals in some country regions.[5]

By contrast, orofacial pain, a broad term encompassing symptoms in the head and neck region, is a frequent form of pain perceived in the face and oral cavity. It may be caused by diseases or disorders of regional structures, nervous system dysfunction, or pain stemming from distant sources.[6] The temporomandibular disorders (TMD), in which painful presentation is a subgroup of orofacial pain, is recognized as a condition of pain or musculoskeletal dysfunction that affects the face in its masticatory structures and encompasses a group of changes involving the temporomandibular joints (TMJ).[7] It is registered as the primary cause of non-dental pain in the orofacial region

and is its most prevalent chronic pain.[8] TMD is defined worldwide as a public health problem[9] in a matrix of multiple possible etiologic factors and interdisciplinary demands.[10] Given its prevalence and relevance in dental practice, knowledge concerning current orofacial pain and temporomandibular disorders in public health services and undergraduate or graduate programs is being debated worldwide.[11]

Also, previous evaluation studies with different outcomes have shown that well-structured human resources and management factors have been associated with better performance in Brazilian PHC.[12,13] These topics underline the importance of good health policy initiatives to improve human resources and management in qualified primary care. Hence, spreading and implementing the orofacial pain service in private or public health systems can improve dental practice, providing relief for a series of conditions and avoiding iatrogenic actions or incorrect references.

Therefore, assessing variables of telehealth demands and resolution figures available from the year before the outbreak of the COVID-19 Pandemic compared to the dissemination of the disease in 2020 is one way to measure and analyze its advantages, shortcomings, and trends over a critical public health period. Accordingly, this study investigated factors associated with avoiding the referral of orofacial pain cases to secondary health care by Brazilian practitioners who demanded asynchronous teleconsulting – the service dedicated to solving PHC professionals' doubts about diagnoses issues or work processes – in 2019 and 2020.

Methods

The study used secondary databases from the asynchronous teleconsulting Telehealth Brazil Networks Program from January 2019 to December 2020. The data source was the national database of the Telehealth Results Monitoring and Evaluation System (SMART, by the acronym in Portuguese), developed in 2014, provided by the Telehealth Centers that are part of the Telehealth Brazil Networks Program.[14] The telehealth centers were implemented in public universities in 25 out of 26 states in the five Brazilian regions.[15] Duplicate data, incomplete information, or data covering issues other than orofacial pain were excluded. The appropriate University Research Ethics Committee provided ethics approval.

The dichotomous variable "If referral to secondary care was avoided" was the outcome, representing the resolvability of the teleconsulting program. Sex, PHC professional category, and doubts related to orofacial pain were the covariates. Sex was dichotomized in males and females. The categories of PHC practitioners were divided into six groups, according to their relationship with orofacial pain treatment[16] and frequency of appearance in the database, as follows: General Dentists, Specialized Dentists, General Physicians, Specialized Physicians, Nurses, and Others. The last one embraces administrative staff, auditor-dentists, dental assistants, community health agents, radiology technicians, biomedical, resident physicians, speech therapists, clinical psychologists, physical therapists, pharmacists, occupational therapists, or uninformed.

SMART registered teleconsulting data according to the International Classification of Diseases 10 Version: 2019 (ICD-10)[17] and the International Classification of Primary Care, second edition (ICPC-2).[18] The last one deals with the reasons for demands beyond the apparent diseases, allowing a better understanding of PHC user problems and perceptions. It is a complementary tool to the traditional ICD and has been gradually recognized as an appropriate classification for family medicine and primary care.[19]

The screening of orofacial pain/TMD doubts was based on the American Academy of Orofacial Pain criteria for this study's purposes.[20] After that, the category of doubts gave rise to three groups based on the proximity to the traditional clinical dental practice, coherent with a current orofacial pain international classification (ICOP)[21] highlighting dental or periodontal origin pain and temporomandibular disorders. Apart from then, a group for "other conditions in the head and neck" represented the demands that, although referring to the structure of the head/neck, are generally related to other distinct medical specialties, such as headaches and sinusitis, and may hinder or overlap in the dental/periodontal or TMD diagnosis.

The three demand groups are described in Figure 1.

Figure 1 – Description of groups of demands for orofacial pain.

Group 1 - Pain or condition of teeth or periodontium
• DS19 Teeth, gum symptom or complaint (ICPC-2) • DS20 Mouth, tongue, lip symptom or complaint (ICPC-2) • K03.0 Excessive attrition of teeth (ICD-10) • K04.0 Pulpitis (ICD-10) • K05.0 Acute gingivitis (ICD-10) • K05.2 Acute periodontitis (ICD-10) • K14.6 Glossodynia (ICD-10) • S02.5 Fracture of tooth (ICD-10)
Group 2 Temporomandibular Disorder
• K07.6 Temporomandibular joint disorders (ICD-10) • L07 Jaw symptom/complaint (ICPC-2)
Group 3 - Other pain/condition in head or neck
• H01 Ear pain/earache (ICPC-2) • N01 Headache (ICPC-2) • N03 Pain face (ICPC-2) • N89 Migraine (ICPC-2) • N91 Facial paralysis/bell's palsy (ICPC-2) • N92 Trigeminal neuralgia (ICPC-2) • N95 Tension headache (ICPC-2) • R09 Sinus symptom/complaint (ICPC-2) • R75 Sinusitis acute/chronic (ICPC-2)

A descriptive analysis of the data was carried out, using frequency, with data stratification by year of demand (2019 or 2020), for sex and category of the primary care professional, and type of condition related to requests in orofacial pain. The regression models estimated the prevalence ratios (PR) and the corresponding 95% confidence interval. Initially, it uses unadjusted and adjusted negative binomial regression models to estimate PR (95%CI) and p values for each of the three covariates. Any covariate with a p-value less than 0.25 was a candidate to be tested in the final negative binomial regression model. Only covariates with a p-value less than 0.05 were maintained in the final model. The final model fit was evaluated using a ratio between the residual deviation and the degree of freedom and the chi-square test of the results of the residual deviation. All analyzes were performed in SPSS version 22.0 (SPSS, Chicago, IL, USA).

Results

From 10,340 orofacial pain teleconsultings stemming from the original 2019/2020 bank data, 7,042 were duplicated or incomplete and excluded. The remaining 3,298 were reassessed for compliance with the eligibility criteria, and 669 were discarded. Finally, 2,629 integrated the analysis: 1,982 referring to 2019 (75.4%) and 647 to 2020 (24.6%) (Figure 2).

From these last, in 2019, 1,522 (76.8%) avoided referral to secondary care, and in 2020, 373 (57.7%) did so, representing a reduction of 19.1%. For 2020, 403 (62.3%) PHC professionals were females, increasing the prior frequency of 55.3% for women. Physicians were the most frequent professional category in 2019 and dentists in 2020. Regarding doubts recorded in teleconsulting (ICD/ICPC), the "other" group was the most frequent in 2019 (67.1%), and the teeth/periodontium group in 2020 (65.5%). Despite the relative growth, general physicians, nurses, "others," and the G2 (TMD) diagnostic category still represented a minor fraction in 2020 (Table 1).

Figure 2 - Flow chart showing the criteria of PHC doubts` search and selection

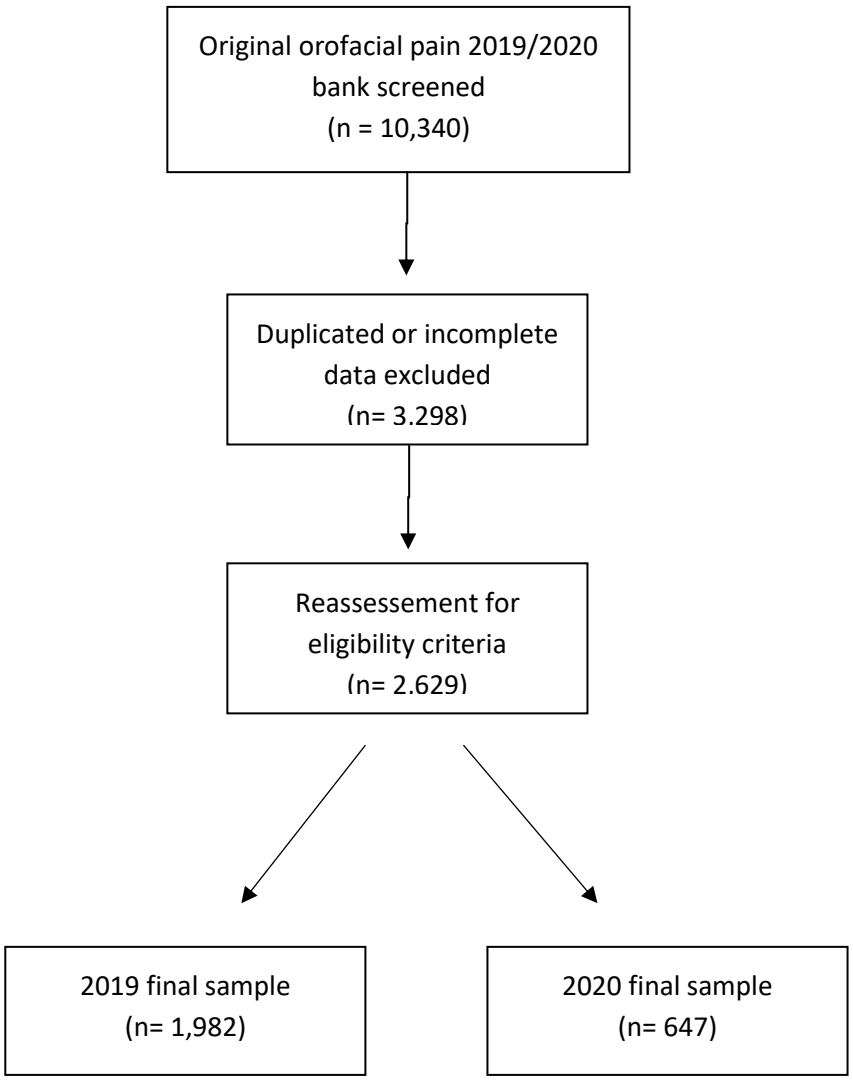

Table 1 - Description of the characteristics of telehealth for orofacial pain in the Unified Health System, Brazil, 2019 and 2020

Variable	2019 (N=1,982) Frequency N (%)	2020 (N=647) Frequency N (%)
If avoided the referral to secondary care		
No	460 (23.2)	274 (42.3)
Yes	1,522 (76.8)	373 (57.7)
Sex of PHC* professional		
Female	1,096 (55.3)	403 (62.3)
Male	886 (44.7)	244 (37.7)
PHC* profession		
General dentist	171 (8.6)	149 (23.0)
Specialized dentist	332 (16.8)	220 (34.0)
General physician	16 (0.8)	14 (2.2)
Specialized physician	1,284 (64.8)	135 (20.9)
Nurse	91 (4.6)	46 (7.1)
Others	88 (4.4)	83 (12.8)
Doubts		
Group 1	619 (31.2)	424 (65.5)
Group 2	33 (1.7)	27 (4.2)
Group 3	1,330 (67.1)	196 (30.3)

*Primary Health Care

In 2019, nurses (PR=0.69 CI 95% 0.57-0.83) and "other professionals" (PR=0.84 CI 95% 0.73-0.97) showed less frequency of avoiding referral of orofacial pain cases to secondary healthcare than general dentists. When the doubts were related to teeth/periodontium conditions (G1), there was a lower frequency of avoiding referral (PR= 0.85 CI 95% 0.77-0.94) than other causes of orofacial pain (G3). In 2020, female professionals avoided referrals more frequently than men (PR=1.24 CI 95% 1.12-1.38). Teeth/periodontium (G1) doubts (PR=1.18 CI 95% 1.06-1.32) and temporomandibular disorders (G2) (PR=1.33 CI 95% 1.15-1.54) surpassed referral avoidance to secondary care than other cases of orofacial pain (G3) (Table 2).

Table 2 - Factors associated with avoiding orofacial pain referral to secondary healthcare in the Unified Health System, Brazil, 2019 and 2020 telehealth

Variables	2019				2020			
	Unadjusted PR (CI 95%)	p-value	Adjusted PR (CI 95%)	p-value	Unadjusted PR (CI 95%)	p-value	Adjusted PR (CI 95%)	p-value
Sex of PHC* professional								
Female	0.97 (0.94-0.99)	0.015			1.27 (1.14-1.41)	<0.001	1.24 (1.12-1.38)	<0.001
Male	1				1		1	
PHC* profession								
Others	0.88 (0.76-1.01)	0.065	0.84 (0.73-0.97)	0.019	0.90 (0.78-1.04)	0.168		
Nurse	0.75 (0.63-0.89)	0.001	0.69 (0.57-0.83)	<0.001	0.89 (0.74-1.08)	0.232		
Specialized Physician	1.15 (1.08-1.22)	<0.001	0.99 (0.88-1.11)	0.828	0.82 (0.72-0.95)	0.006		
General Physician	0.96 (0.75-1.22)	0.719	0.82 (0.64-1.07)	0.129	0.99 (0.77-1.27)	0.952		
Specialized Dentist	0.96 (0.89-1.04)	0.330	0.96 (0.89-1.04)	0.354	0.95 (0.86-1.05)	0.275		
General Dentist	1		1		1			
Doubts								
Group 1	0.82 (0.79-0.86)	<0.001	0.85 (0.77-0.94)	0.001	1.21 (1.08-1.36)	0.001	1.18 (1.06-1.32)	0.040
Group 2	0.92 (0.81-1.04)	0.175	0.96 (0.82-1.11)	0.551	1.39 (1.19-1.62)	<0.001	1.33 (1.15-1.54)	0.001
Group 3	1		1		1		1	

*Primary Health Care

Discussion

A change was observed in both the descriptive characteristics of asynchronous teleconsulting on orofacial pain and the factors associated with avoiding referrals to secondary health care from 2019 to 2020. In 2019 (before the COVID-19 Pandemic), physicians were the most frequent professionals demanding teleconsulting for orofacial pain. The majority of the demands were related to non-tooth conditions. In 2020, the first year of the COVID-19 Pandemic, dentists were the most frequent professionals, and teeth/periodontium doubts were the most frequent. Noteworthy, Teleconsulting's ability to avoid referral to secondary health care and the number of demands decreased from 2019 to 2020. In 2019, professional groups and doubts were associated with avoiding referrals. In 2020, the sex of professionals and doubts were associated with this outcome.

The drop in the total teleconsulting over the assessed period stands out. It may represent a consequence of the general global disarray or disruption in the health system caused by the Pandemic, which forced organizations to focus on COVID-19 issues rather than regular services. Services were suddenly rearranged to deal mainly with pandemic issues or urgencies, leaving behind some previously structured programs and other essential health needs.[22] Similarly, the apparent drop in physicians' demands in 2020 coincides with the burden of the COVID-19 Pandemic. The mobility restrictions prevented in-person health facility visits and face-to-face patient-doctor interaction, and the shift from traditional care to telehealth occurred for a limited period, demanding rapid training and personnel allocation.[23] In this scenario, the physicians may have initially interrupted regular and elective procedures in favor of medical urgencies, not to mention the staff directly involved with COVID-19 patient management. This fast and somewhat chaotic change may explain the withdrawal of physicians in teleconsulting devoted to orofacial pain issues in the stressful pandemic context of 2020.[24] Concerning types of doubts, the preeminence of the G3 group over G1 and G2 in 2019 and the reverse in 2020, follows this same scenario, as "other conditions in the head and neck" represented the demands in general related to medical specialties, such as headaches and sinusitis.

The dentists themselves and the doubt categories related to teeth/periodontium conditions (G1) were the most frequent in the 2020 sample. It matches the reallocation of dental professionals in the Public Health System during the Pandemic, leaving their previous routine in favor of managing face-to-face dental urgencies, potentially leading several dental branches to search for information on acute dental conditions in teleconsulting. It is important to note that dental pain is reported as a relevant fraction of dental urgencies [25] and represents the most frequent category of orofacial pain.[26] The general 2020 increase of females in the sample matches the increase of dentists. Women also represent a relevant fraction in Brazilian dental schools in the national dental public health system.[27] In contrast, the G2 (TMD) diagnostic category represented a minor fraction in both years assessed. This situation may reflect the mechanical and technical classical tendencies of dental formation, contrasting with the complexity of chronic conditions like TMD, which tend to be overlooked in favor of the relative simplicity of acute urgent pathologies. The novelty of the TMD/orofacial pain field in dental schools may also contribute.[28]

In 2019 (the pre-pandemic year), nurses and other professionals showed a lower referral avoidance performance than general dentists. Despite the notorious wide range of diagnostic conditions involved and interdisciplinarity, orofacial pain is traditionally a dental branch gradually recognized as a dental specialty. In Brazil, the area has been considered a separate dental specialty from the Federal Council of Dentistry rule since 2002.[28] This specific dental background in orofacial issues would give dentists a higher capacity for resoluteness in this field than nurses and other professionals. By contrast, in 2019, the lower frequency of avoiding referrals from tooth/periodontium issues could be partly explained by the full availability of the secondary service chain. In an average period, without the pandemic restrictions, the steady health system flow to secondary aid permits PHC professionals to refer a higher number of mild or moderate cases. This standard would change during the Pandemic.

The upsurge in the Pandemic in 2020 marks the preeminence of dentists in the sample. Nurses and "other professionals" in 2020 did not show the same negative association as in 2019. This situation may well reflect the staff reallocation and training in a disruptive period to deal with acute dental concerns, granting fewer referrals (some "other professionals" were already dental practice-related, such as dental assistants). The increase in the proportion of dentists in the sample could result in more resolution capacity of G1 and G2 doubts.[28] Women's higher performance may also be associated

with their higher commitment to health care during a pandemic, requiring more in-depth investigation.[29,30]

The severe acute respiratory syndrome caused by Coronavirus 2 (SARS-Covid 2), or COVID-19, with the surge in 2020, still represents a massive problem to healthcare systems worldwide, with millions of dead by that year. A "Post-Covid Syndrome" can last beyond the acute 4-week period and affects multiple organs and systems, also related to widespread pain (myalgia) and headaches.[31] Although still under debate and extensive investigation, it will inevitably require interdisciplinary health teams for its study, control, and surveillance, most likely for extended periods. In this regard, telehealth (encompassing teleconsulting) for managing chronic conditions must also find a fertile field of application and expansion ahead.[32,33] Notwithstanding the eventual distortions, challenges in implementation, and lack of randomized controlled assessments of its clinical outcomes and long-term economic analyses[34] these technological advantages are paramount to reducing inequities in periods of high health challenging demands, much like the outbreak of the COVID-19 Pandemic in 2019-2020.[35]

Limitations

This article presents some limitations. First, the short period covering data investigation (2019 and 2020) may not reflect the impact of previous or posterior tendencies upon the Telehealth usage characteristics; therefore, comprehensive time-covering data analysis still needs to be conducted. Second, the cross-sectional study design does not enable inferences regarding causality. Third, the effect of other covariates, such as patient characteristics on demographic and clinical status, were not available in this dataset.

Conclusions

There was a difference in descriptive elements and factors associated with avoiding referrals from 2019 to 2020. Females prevailed in both years, and the total demand decreased to a third from 2019 to 2020. The rate of resoluteness decreased by 19.1%. In 2019, specialized physicians were the most prevalent professionals, with dentists and teeth/periodontal doubts appearing the least. In 2019, nurses and other professionals showed a lesser frequency of avoiding referrals than did general dentists. In 2020, doubts about teeth/periodontal and temporomandibular disorders surpassed other causes of orofacial pain in avoiding referrals, and female professionals avoided referrals more frequently than men.

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6 CONSIDERAÇÕES FINAIS

Em resumo, a revisão sistemática demonstrou muito pouca certeza de evidência para a associação entre estresse no trabalho e DTM, dado o número limitado de artigos e as várias deficiências metodológicas. Já o estudo transversal sobre teleconsultorias em dores orofaciais no Brasil evidenciou o efeito da pandemia na distribuição das variáveis na amostra em 2020, realocando serviços e profissionais, e revelando uma maior resolutividade para profissionais mulheres, cirurgiões-dentistas e demandas associadas à odontologia no mesmo período. Espera-se que mais estudos, com apurados desenhos metodológicos e com maior abrangência temporal, surjam para avaliar tanto a interrelação DTM e estresse ocupacional quanto questões envolvidas no cuidado às populações com DTM e dores orofaciais no Brasil e no mundo, seja no formato presencial ou à distância.

Esta tese enfatiza a importância do estudo epidemiológico das DTM e das dores orofaciais, condições nem sempre representadas por investigações em quantidade e qualidade metodológica adequadas, seja no âmbito ocupacional ou das várias questões relacionadas ao serviço público/privado de saúde. Essa lacuna impede que análises oriundas de dados confiáveis gerem soluções tempestivas e adequadas para os diversos órgãos de administração em saúde pública, em especial. As tecnologias em saúde, por sua vez, foram vastamente utilizadas durante a pandemia de COVID-19 e são ainda um campo fértil a ser explorado – principalmente por países como o Brasil - com seus desafios socioeconômicos e de integração geográfica. A telessaúde, com as teleconsultorias em particular, estreitam a relação entre profissionais de saúde e produzem respostas às suas diversas dúvidas, contribuindo ainda para a capacitação das equipes.

Os estratos sociodemográficos de pacientes e profissionais, as categorias da assistência ofertada, os diversos fatores laborais relacionados a essas complexas e prevalentes patologias e outras tantas variáveis relacionadas ao tema são um vasto material à nossa disposição, tanto no viés da geração de conhecimento, quanto da resolução do cuidado à saúde de pessoas com DTM e dores orofaciais.

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APÊNDICE A – Revisão sistemática pulicada na BioMed Research International, Open Access, Impact Factor 3.411 (primeira página)

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Review Article

Association between Stress at Work and Temporomandibular Disorders: A Systematic Review

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Temporomandibular disorders (TMD) have been traditionally associated with psychosocial factors; however, occupational stress as a factor related to TMD has not been adequately assessed in the literature. The aim was to investigate the association between stress at work and TMD on adult paid workers. An electronic search included PubMed, Scopus, Web of Science, Embase, and LILACS databases. Manual searches in the included articles' reference and gray literature were performed. There were no restrictions regarding language or publication period. The inclusion criteria comprised observational studies with paid workers of any category, of both sexes, above 18 years old, assessing occupational stress/stress or distress and TMD as diagnosis or isolated signs and symptoms. Methodological quality was evaluated using Joanna Briggs tools. We narratively assessed the evidence using the Grading of Recommendations, Assessment, Development, and Evaluation (GRADE) approach. We collected 12 studies. 50% reported a positive association between stress and TMD diagnostic across various job categories. On the other hand, TMJ sounds (a TMD sign) and work stress were associated only in a musicians' population. However, the shortage of eligible articles and the methodological limitations provided a very low certainty of the evidence; only 4 of the studies used validated tools for both stress and TMD (2 reporting positive association). The association between stress and TMD is inconclusive by the available data. In the future, we expect more robust epidemiologic studies addressing these relevant aspects.

1. Introduction

Temporomandibular disorder (TMD) is a condition of pain or musculoskeletal dysfunction that affects the face in its masticatory structures and encompasses a group of changes involving the temporomandibular joints. It represents the primary cause of nondental pain in the orofacial region [1], and it is the most prevalent chronic pain [1, 2]. Like chronic pain in general, TMD is defined as a clinical and public health problem [3]. Due to extensive variations in the methodological criteria employed, there is considerable variation in the prevalence of TMD signs and symptoms in epidemiological studies (from 3% to 80%) [4, 5]. The TMD diagnostic con- cepts represent a matter of debate over the past decades, evolving from sparse TMD signs and symptoms to the well- structured Research Diagnostic Criteria for Temporoman- dibular Disorders (RDC/TMD). Its upgraded version is the Diagnostic Criteria for Temporomandibular Disorders (DC/TMD) Consortium Network, a worldwide effort to improve and standardize the diagnostic tools for research

APÊNDICE B – Parecer com aprovação do projeto pelo CEP da Universidade Federal de Minas Gerais

PARECER CONSUBSTANCIADO DO CEP

DADOS DO PROJETO DE PESQUISA

Título da Pesquisa: ANÁLISE NACIONAL DAS TELECONSULTORIAS ASSÍNCRONAS DO TELESSAÚDE

Pesquisador: Renata de Castro Martins

Área Temática:

Versão: 2

CAAE: 17400319.9.0000.5149

Instituição Proponente: UNIVERSIDADE FEDERAL DE MINAS GERAIS

Patrocinador Principal: Financiamento Próprio

DADOS DO PARECER

Número do Parecer: 3.662.611

Apresentação do Projeto:

Trata-se de um estudo transversal cujo objetivo é avaliar as teleconsultorias odontológicas assíncronas do Programa Telessaúde Brasil Redes através de banco de dados, referente aos núcleos de telessaúde do Programa Telessaúde Brasil Redes. Os núcleos de telessaúde, responsáveis pela oferta de teleconsultorias, são implantados em universidades públicas em diversos estados brasileiros. Os instrumentos de avaliação serão as teleconsultorias assíncronas, obtidas de banco de dados secundários do Sistema de Monitoramento e Avaliação de Resultados do Telessaúde (SMART), que integra as informações de serviços prestados pelos Núcleos de Telessaúde que fazem parte do Programa Nacional Telessaúde Brasil Redes no período de 2017 a 2020. O acesso às informações será solicitado ao responsável pela guarda dos dados, com base na Lei nº 12.527, de 18 de novembro de 2011, que regula o acesso a informações em conformidade com os princípios básicos da administração pública da União, Estados, Distrito Federal e Municípios. Esta Lei considera, entre outras prerrogativas, informação como dados, processados ou não, que podem ser utilizados para produção e transmissão de conhecimento, contidos em qualquer meio, suporte ou formato. Serão coletadas as seguintes variáveis independentes: núcleo de Telessaúde, sexo e profissão do solicitante da teleconsultoria (profissional da atenção primária do SUS), data e horário da pergunta e resposta, tempo até a resposta, área odontológica da dúvida da teleconsultoria e

tipos de dúvidas mais frequentes. Os dados sobre os estados solicitantes de teleconsultorias: Índice de Desenvolvimento Humano (IDH), Índice de Gini, população e macrorregiões do Brasil serão coletados no Instituto Brasileiro de Geografia e Estatística (IBGE) (BRASIL, 2016). Como variáveis dependentes (desfechos do estudo) serão utilizadas as respostas a quatro variáveis mensuradas a partir de perguntas respondidas pelos usuários que solicitam as teleconsultorias no serviço. A primeira será a satisfação do profissional da atenção primária com a resposta da teleconsultoria. A segunda será a efetividade do serviço, avaliada a partir da resposta à pergunta: "Se a teleconsultoria resolveu a dúvida". Já a terceira e a quarta serão sobre a resolutividade do serviço, mensurada a partir da conduta realizada após a teleconsultoria: i) "Se o solicitante tinha a intenção de encaminhar o paciente" (sim ou não); e ii) "Se a teleconsultoria evitou o encaminhamento do paciente" (sim, não, não informado). Os dados obtidos serão analisados descritivamente por meio de frequência, análise de Cluster, de série temporal e geoespacial comparando-os entre as macrorregiões brasileiras, nos programas IBM SPSS Software versão
22.0 e Stata versão 15.0, considerando uma significância de 5%.

Objetivo da Pesquisa:

Objetivo Primário: Avaliar as teleconsultorias Odontológicas do Telessaúde Brasil Redes no período de 2017 a 2020. Objetivo Secundário: Avaliar a frequência de teleconsultorias assíncronas do Telessaúde Brasil Redes de acordo com núcleo de Telessaúde, sexo e profissão do solicitante da teleconsultoria (profissional da atenção primária do SUS); data e horário da pergunta e resposta (tempo médio gasto até a resposta e demanda dentro do horário de trabalho); área odontológica da dúvida da teleconsultoria, tipos de dúvidas mais frequentes, satisfação dos solicitantes (se a teleconsultoria ajudou) e a resolutividade das teleconsultorias odontológicas do Telessaúde Brasil Redes (se evitou o encaminhamento de pacientes para a atenção especializada) com dados sóciodemográficos dos estados e macrorregiões brasileiras (IDH, Índice de Gini e tamanho da população); Avaliar associação entre satisfação dos solicitantes das teleconsultorias odontológicas e resolutividade do serviço do Telessaúde Brasil Redes e as macrorregiões brasileiras.

Avaliação dos Riscos e Benefícios:

Riscos: Há risco de quebra de confidencialidade e anonimato durante a consulta ao banco de dados, no entanto, a consulta será feita sem identificar o nome dos indivíduos, mantendo o sigilo e o cuidado com para a não identificação do sujeito. Benefícios: Esta pesquisa contribuirá com conhecimentos sobre como está sendo realizado o Telessaúde no Brasil, sua efetividade e se há diferenças de demandas entre as macrorregiões brasileiras com diferentes IDHM, bem como, entre os estados brasileiros, com o intuito de promover melhorias tanto para os profissionais de saúde da atenção básica do SUS, quanto para os usuários do serviço.

Comentários e Considerações sobre a Pesquisa:

Pesquisa relevante para a área de saúde pública e odontologia, conforme parecer departamental.

Considerações sobre os Termos de apresentação obrigatória:

Foram apresentados:
Folha de rosto devidamente assinada Parecer departamental aprovado
Projeto completo com termo de anuência / autorização para acesso ao banco de dados do Sistema de Monitoramento e Avaliação dos Resultados do Telessaúde (SMART)
Pedido de dispensa de TCLE TCUD

Recomendações:--

Conclusões ou Pendências e Lista de Inadequações:

SMJ sou favorável à aprovação da pesquisa.

Considerações Finais a critério do CEP:

Tendo em vista a legislação vigente (Resolução CNS 466/12), o CEP-UFMG recomenda aos Pesquisadores: comunicar toda e qualquer alteração do projeto e do termo de consentimento via emenda na Plataforma Brasil, informar imediatamente qualquer evento adverso ocorrido durante o desenvolvimento da pesquisa (via documental encaminhada em papel), apresentar na forma de notificação relatórios parciais do andamento do mesmo a cada 06 (seis) meses e ao término da pesquisa encaminhar a este Comitê um sumário dos resultados do projeto (relatório final).

Este parecer foi elaborado baseado nos documentos abaixo relacionados:

Tipo Documento	Arquivo	Postagem	Autor	Situação
Informações Básicas do Projeto	PB_INFORMAÇÕES_BÁSICAS_DO_PROJETO_1335673.pdf	14/10/2019 10:54:29		Aceito
Outros	Carta_resposta.pdf	14/10/2019 10:52:42	Renata de Castro Martins	Aceito
Declaração de Pesquisadores	TCUD.pdf	14/10/2019 10:52:17	Renata de Castro Martins	Aceito
TCLE / Termos de Assentimento / Justificativa de Ausência	Pedido_isencao_TCLE.pdf	05/07/2019 17:37:53	Renata de Castro Martins	Aceito

ntinuação do Parecer: 3.662.611

Outros	Aprovacao_projeto.pdf	05/07/2019 17:32:52	Renata de Castro Martins	Aceito
Projeto Detalhado / Brochura Investigador	Projeto_Doutorado_Ligia_COEP.pdf	05/07/2019 17:23:53	Renata de Castro Martins	Aceito
Folha de Rosto	folhaDeRosto_2019.pdf	05/07/2019 17:10:24	Renata de Castro Martins	Aceito

Situação do Parecer: Aprovado

Necessita Apreciação da CONEP: Não

BELO HORIZONTE, 25 de Outubro de 2019

Assinado por:

Eliane Cristina de Freitas Rocha (Coordenador(a))

APÊNDICE C – Concessão de acesso à base de dados em telessaúde do Ministério da Saúde pela Plataforma Integrada de Ouvidoria e Acesso à Informação

CONTROLADORIA-GERAL DA UNIÃO

Fala.BR - Plataforma Integrada de Ouvidoria e Acesso à Informação

Entrar (../../Login/Identificacao.aspx) Cadastrar (../Usuarios/AutoCadastroUsuarioCidadao.aspx)

Consultar

Manifestação

Respostas

17/05/2020
22:56

Tipo

Resposta Conclusiva

Responsável

DEPARTAMENTO DE SAÚDE DIGITAL-DESD/SE/MS

Decisão

Acesso Concedido

Especificação da decisão

Resposta solicitada inserida no Fala.Br

Destinatário Recurso 1ª

Prazo para recorrer

28/05/2020

Anexos

Não existem anexos

EM RESPOSTA A DEMANDA

ATRAVéS DE E-MAIL, FOI FEITA A COMUNICAçãO COM A SOLICITANTE E LIBE
CONSEGUIR OS DADOS SOLICITADOS, ALéM DISSO, FOI FEITO CONTATO CO
SMART NA UFRN PARA DISPONIBILIZAR OS DADOS COM RELAçãO AOS C
SOLICITANTE.

AS DEMAIS COMUNICAçõES, ESTãO SENDO FEITAS DIRETAMENTE POR E-MAI

Teor

Resumo

Autorização para acesso de dados do Programa Telessaúde - Plataforma SMART

Fale aqui

Meu nome é Lígia (http://lattes.cnpq.br/1481315275445738), sou aluna de doutorado em Odontologia na UFMG. Durante o mestrado, avaliei o Programa Telessaúde em MG, analisando as teleconsultorias offline realizadas na área da Odontologia. Em 2017, participei com a minha orientadora, Renata Martins (http://lattes.cnpq.br/9830587097758541) do 8° CTBMS, onde conhecemos o Jetro Silva, que nos apresentou a plataforma SMART.

Ficamos muito interessadas, pois os bancos de dados de MG passaram por uma grande perda de informações nos últimos anos. Acreditamos ser de grande valor iniciativas que buscam avaliar programas públicos, pois contribuem para a revisão de metas, aperfeiçoamento e benefícios, tanto para os profissionais que o utilizam, quanto para a população. Então, para o doutorado, estruturamos um projeto para avaliar os dados de todo o Brasil, que já foi aprovado pelo colegiado de pós-graduação da UFMG, assim como pelo Cômite de Ética em Pesquisa da UFMG.

Recentemente solicitamos por meio do protocolo 25820008939201916, ao Departamento de Saúde Digital, autorização para que possamos acessar os dados contidos no SMART referentes às teleconsultorias offline Odontológicas, considerando o período de 2017 a 2020. As variáveis necessárias seriam: Região do país, Estado e Núcleo de

Nome

CID 10 relacionados à Odontologia.doc

Lista CIAP Odontologia.doc

Manifestação

Tipo de manifestação
Acesso à Informação
Número
25820.003613/2020-28

Esfera

Federal

Órgão destinatário

MS – Ministério da Saúde

Serviço

-

Órgão de interesse

-

Assunto

Outros em Saúde

Subassunto
Tag

-

Anexos

Anexos da Manifestação

Origem	Nome	Extensão
Anexo Manifestação	CID 10 relacionados à Odontologia.doc	doc
Anexo Manifestação	Lista CIAP Odontologia.doc	doc
Anexo Manifestação	PB_PARECER_CONSUBSTANCIADO_CEP_3662611 (1).pdf	pdf

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Históricos de ações

Histórico de ações

Data/Hora	Ação	Responsável	Informações Adicionais
27/04/2020 14:41	Cadastro	Órgão	
17/05/2020 22:56	Registro Resposta	Órgão	

Encaminhamentos

Não foram encontrados registros.

Prorrogações

Não foram encontrados registros.

Respostas as pesquisas de satisfação

Não foram encontrados registros.

Voltar à Página Inicial | Responder Pesquisa | Imprimir

Voltar ao Topo ^

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Community Dentistry and Oral Epidemiology attempts to keep the review process as short as possible to enable rapid publication of new scientific data. In order to facilitate this process, please suggest the names and current email addresses of two potential international reviewers whom you consider capable of reviewing your manuscript. Whether these are used is up to the Editor, but it is helpful to have the suggestions.

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You may suspend a submission at any phase before clicking the 'Submit' button and save it to submit later. The manuscript can then be located under 'Unsubmitted Manuscripts' and you can click on 'Continue Submission' to continue your submission when you choose to.

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will be submitted to at least 2 reviewers for peer review, and comments from the reviewers and the editor will be returned to the corresponding author.

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Community Dentistry & Oral Epidemiology requires that sources of institutional, private and corporate financial support for the work within the manuscript must be fully acknowledged, and any potential grant holders should be listed. Acknowledgements should be brief and should include information concerning conflict of interest and sources of funding. It should not include thanks to anonymous referees and editors.

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        - funding statement
        - conflict of interest disclosure
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- Abstract
- Up to seven keywords
- Main body
- References
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4.1. Word Limit and Page Charges

Articles should be limited to 3,700 words (including references) and 6 Tables or Figures; alternatively, 4,000 words and 5 Tables or Figures may be used. This equates to seven published pages, **and authors are strongly encouraged to stay within those limits.** The Methods and Results sections are usually where the word count can "blow out", and authors are encouraged to consider submitting heavily detailed material for inclusion in a separate online Appendix to their article (at no cost). **Articles exceeding seven published pages are subject to a charge of USD 300 per additional page. One published page amounts approximately to 5,500 characters (including spaces) of text but does not include Figures and Tables.**

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All submissions must be in English; both British and American spelling conventions are acceptable. Authors for whom English is a second language must have their manuscript professionally edited by an English speaking person before submission to make sure the English is of high quality. It is preferred that the manuscript is professionally edited. A list of independent suppliers of editing services can be found at **http://wileyeditingservices.com/en/**. All services must be paid for and arranged by the author, and use of one of these services does not guarantee acceptance or preference for publication.

Font: All submissions must be 1.5 spaced using a standard 12-point font size, and preferably in the Times Roman font.
Abbreviations, Symbols and Nomenclature: Authors can consult the following source: CBE Style Manual Committee. Scientific style and format: the CBE manual for authors, editors, and publishers. 6th ed. Cambridge: Cambridge University Press, 1994

4.3. Structure

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Title Page: the names and institutional affiliations of all authors of the manuscript should be included.
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Main Text of Original Articles should include Introduction, Methods, Results and Discussion. Subheadings are not encouraged.
Introduction: this should be focused, outlining the historical or logical origins of the study and not summarise the findings; exhaustive literature reviews are not appropriate. It should close with an explicit statement of the specific aims of the investigation.
Methods must contain sufficient detail such that, in combination with the references cited, all studies reported can be fully reproduced. As a condition of publication, authors are required to make materials and methods used freely available to other academic researchers for their own use.
Results should not focus overly on P values – we concur with recent calls for less emphasis on statistical significance (see Amrhein et al, Nature 2019; 567: 305-307). In the Results section, have one paragraph of text per Table, and do not repeat Table data in that Results text; instead, draw the reader's attention to the highlights/important parts of the Table. Avoid "compared to" - use 'than' instead.
Discussion: See Docherty and Smith, BMJ 1999; 318: 1224-5 for how to structure a Discussion section. That structure is encouraged. The section should end with a brief conclusion and a comment on the potential clinical program or policy relevance of the findings. Statements and interpretation of the data should be appropriately supported by original references. In the Discussion and conclusion, use the term 'findings' rather than 'results'.

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Journal article:

1. King VM, Armstrong DM, Apps R, Trott JR. Numerical aspects of pontine, lateral reticular, and inferior olivary projections to two paravermal cortical zones of the cat cerebellum. *J Comp Neurol* 1998;390:537-551.

Book:

2. Voet D, Voet JG. *Biochemistry*. New York: John Wiley & Sons; 1990. 1223 p.

Please note that journal title abbreviations should conform to the practices of Chemical Abstracts.

For more information about AMA reference style - **AMA Manual of Style**

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Preparation of Electronic Figures for Publication: Although low-quality images are adequate for review purposes, print publication requires high quality images to prevent the final product being blurred or fuzzy. Submit EPS (lineart) or TIFF (halftone/photographs) files only. MS PowerPoint and Word Graphics are unsuitable for printed pictures. Do not use pixel-oriented programmes. Scans (TIFF only) should have a resolution of 300 dpi (halftone) or 600 to 1200 dpi (line drawings) in relation to the reproduction size (see below). EPS files should be saved with fonts embedded (and with a TIFF preview if possible). For scanned images, the scanning resolution (at final image size) should be as follows to ensure good reproduction: line art: >600 dpi; half-tones (including gel photographs): >300 dpi; figures containing both halftone and line images: >600 dpi.

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Special issues: Larger papers, monographs, and conference proceedings may be published as special issues of the journal. The full cost of these extra issues must be paid by the authors. Further information can be obtained from the editor or publisher.

OUTROS TRABALHOS E PROJETOS

Durante o período do doutorado, realizei alguns projetos complementares que considero relevantes e que de alguma forma estão conectados à área acadêmica; outros ainda aguardam um desfecho futuro. Estão citados abaixo:

Participei, em junho de 2021, como palestrante do congresso da International Association for Dental Research *"2021 IADR/AADR/CADR General Session & Exhibition"* (https://www.iadr.org/events/2021iags), apresentando o resumo da revisão sistemática abordada nessa tese (ARANHA, 2021[a]). Um poster do resumo e um pequeno arquivo de áudio foram anexados e disponibilizados no site da instituição, e espero a publicação oficial nos anais do congresso, provavelmente em 2022. O mesmo resumo foi apresentado no congresso anual da SBPqO/2021 (Sociedade Brasileira de Pesquisa Odontológica/Divisão Brasileira da IADR) pelo bolsista e aluno de graduação Diego Rodrigues de Aguilar.

Em conjunto com a cirurgiã-dentista e psicóloga Daniela Aguiar Franzen publiquei, na seção "Cadernos SBDOF," da Sociedade Brasileira de Dor Orofacial, um pequeno artigo de revisão que aborda as principais estratégias cognitivo comportamentais para tratamento das disfunções temporomandibulares. O mesmo texto, reelaborado, expandido e traduzido para a língua inglesa resultou no artigo "*Cognitive-Behavioral Strategies for Controlling Temporomandibular Disorders and Bruxism: A Brief Review"* (ARANHA, 2021[b]). O tema é de relevância para a área, pois embora muito citado, raramente é tratado com a devida concisão e profundidade.

Escrevi também, em 2019, um livro texto intitulado "*Orofacial Pain, Occlusion & Science: A Guide to Better Devise a Grounding Change in Dentistry*," que elabora de forma aprofundada e clara o papel da oclusão no contexto das DTM/DOF, além das diversas categorias de dores dentárias, priorizando o diagnóstico em seus vários detalhes e armadilhas (ARANHA, 2019) - pretendo atualizá-lo e expandi-lo em breve. Seguindo a mesma linha, está em processo de revisão por pares, no periódico online *Annals of Dentistry and Oral Health*, um comentário crítico de minha autoria, submetido ao site do jornal em maio de 2022. O texto "*A Critical Point Concerning Old and Recent Articles on Occlusal Factors and Temporomandibular Disorders"* debate algumas publicações recentes dedicadas ao tema "oclusão e DTM." Por fim, o artigo "*Factors Associated with Avoiding Referrals of Orofacial Pain Cases to Secondary Dental Care by*

Telehealth in Brazil: a Cross-Sectional Study on Orofacial Pain in 2019 and 2020", citado no corpo dessa tese e submetido ao periódico *Community Dentistry and Oral Epidemiology,* ainda aguarda a resposta final sobre a submissão.