UNIVERSIDADE FEDERAL DE MINAS GERAIS
Faculdade de Odontologia
Colegiado de Pós-Graduação em Odontologia

Maria Tereza de Abreu Scalzo

DESEMPENHO DAS EQUIPES DE SAÚDE BUCAL NO BRASIL EM RELAÇÃO ÀS AÇÕES DE ATENÇÃO PRIMÁRIA À SAÚDE

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Tese apresentada ao Colegiado de Pós-Graduação em Odontologia da Faculdade de Odontologia da Universidade Federal de Minas Gerais, como requisito parcial para obtenção do título de Doutora em Odontologia, área de concentração em Saúde Coletiva

Orientadora: Profa. Dra. Renata de Castro Martins
Coorientador: Prof. Dr. Mauro Henrique Nogueira Guimarães de Abreu

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DESEMPENHO DAS EQUIPES DE SAÚDE BUCAL NO BRASIL EM RELAÇÃO ÀS AÇÕES DE ATENÇÃO PRIMÁRIA À SAÚDE

MARIA TEREZA DE ABREU SCALZO

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Grandes coisas estão por vir!

“Mesmo com todo mérito do mundo, no final, as coisas dão certo ou errado por uma questão de sorte. Por uma questão de graça. Por uma questão de Deus.”

Samer Agi

RESUMO

O “Programa Nacional de Melhoria do Acesso e Qualidade da Atenção Básica – PMAQ-AB” foi lançado em 2011 pelo Ministério da Saúde, com objetivo de induzir a ampliação do acesso e a melhoria da qualidade da Atenção Primária em Saúde (APS) no Sistema Único de Saúde (SUS). O programa foi organizado em quatro fases que se complementam e conformam um ciclo contínuo: adesão e contratualização; desenvolvimento; avaliação externa e recontratualização. Com esse desenho, o PMAQ-AB buscou superar desafios para a qualificação da APS. O objetivo deste estudo foi descrever, analisar e compreender o desempenho das Equipes de Saúde Bucal (ESB) participantes do PMAQ-AB, por meio dos procedimentos odontológicos realizados, comparando os achados entre os ciclos e entre as regiões brasileiras. Utilizaram-se dados secundários do 2º e 3º ciclos do PMAQ-AB, ocorridos entre 2013 e 2019. Os dados foram obtidos na fase de avaliação externa, que envolveu entrevista com dentistas sobre o processo de trabalho das equipes. Este trabalho resultou em três artigos científicos. O primeiro e segundo artigo utilizaram dados do 3º Ciclo. No primeiro artigo realizou-se uma análise descritiva de 26 procedimentos odontológicos realizados na APS. Cada procedimento realizado atribuiu uma pontuação à ESB, sendo a pontuação final a soma do número de procedimentos realizados. Estas pontuações foram comparadas entre as regiões do país. Os resultados revelaram que as equipes realizaram, em média, 19,45 (±3,16) dos 26 procedimentos odontológicos analisados. As ESB do Sul, Sudeste e Nordeste realizaram um número maior de procedimentos, enquanto as equipes do Norte e Centro-Oeste realizaram, em média, menos procedimentos. No segundo artigo, foram avaliados 13 procedimentos (itens) relacionados a procedimentos odontológicos espontâneos, preventivos, cirúrgico, restauradores, protético e de câncer bucal. A Teoria da Resposta ao Item (TRI) foi utilizada para estimar as pontuações de desempenho das ESB, com base nos itens. A relação entre os escores de desempenho e as variáveis contextuais (Índice de Desenvolvimento Humano - IDH, e Índice de Gini) nas regiões brasileiras foi analisada por mapas temáticos e correlação de Pearson ($p<0,05$). Os procedimentos com maiores níveis de dificuldade e menos frequentemente realizados foram aqueles relacionados a próteses dentárias e monitoramento do câncer bucal. Os itens foram mais apropriados para discriminar ESB com baixo desempenho, e relativamente ineficazes para diferenciar aquelas com melhor desempenho. Os mapas temáticos mostraram uma relação direta com o IDH ($p < 0,0001$) e uma relação indireta com o índice de Gini ($p= 0,0001$). No terceiro artigo realizou-se um estudo comparativo do desempenho das equipes das ESB que participaram dos dois últimos ciclos de avaliação do PMAQ-AB, analisando 11 procedimentos odontológicos coincidentes nestes ciclos. A TRI foi utilizada para estimar os escores de desempenho das ESB em cada ciclo e esses escores foram comparados pelo teste de Wilcoxon ($p \leq 0,05$), para o Brasil e regiões brasileiras. Os achados indicam que houve melhora nos escores de desempenho das ESB entre os dois ciclos no Brasil e nas regiões brasileiras. As regiões Nordeste, Centro-Oeste e Norte apresentaram as maiores evoluções. Porém, diferenças regionais ainda persistem, sendo necessário estruturar e melhorar as políticas públicas a fim de expandir e qualificar o processo de trabalho dos serviços de saúde bucal, promovendo uma melhor distribuição regional das ESB, a fim de reduzir as desigualdades.

Palavras-chave: atenção primária à saúde; serviços de saúde bucal; equipe de saúde bucal; avaliação de serviços de saúde.

ABSTRACT

Performance of oral health teams in Brazil in relation to primary health care actions.

The "National Program for Improvement of Primary Care Access and Quality - PMAQ-AB" was launched in 2011 by the Ministry of Health, aiming to induce the expansion of access and improvement of the quality of Primary Health Care (PHC) in the Unified Health System (SUS). The program was organized into four phases that complement each other and form a continuous cycle: adherence and contractualization; development; external evaluation and recontractualization. With this design, the PMAQ-AB sought to overcome challenges for the qualification of PHC. The objective of this study was to describe, analyze, and understand the performance of the Oral Health Teams (OHT) participating in PMAQ-AB, through dental procedures performed, comparing the findings between cycles and between Brazilian regions. Secondary data from the second and third cycles of PMAQ-AB, which occurred between 2013 and 2019, were used. The data were obtained in the external evaluation phase, which involved interviewing dentists about the work process of the teams. The first and second article used data from the third cycle. In the first article, a descriptive analysis of 26 dental procedures performed in the PHC was done. Each procedure performed attributed a score to the OHT, and the final score was the sum of the number of procedures performed. These scores were compared among the regions of the country. The results revealed that the OHTs performed, on average, 19.45 (±3.16) of the 26 dental procedures analyzed. The OHTs from the South, Southeast and Northeast performed a higher number of procedures, while the teams from the North and Midwest performed, on average, fewer procedures. In the second article, 13 procedures (items) related to spontaneous, preventive, surgical, restorative, prosthetic, and oral cancer dental procedures were evaluated. Item Response Theory (TRI) was used to estimate the OHT performance scores based on the items. The relationship between performance scores and contextual variables (Human Development Index - HDI, and Gini Index) in Brazilian regions was analyzed by thematic maps and Pearson correlation ($p<0.05$). The procedures with higher levels of difficulty and less frequently performed were those related to dental prostheses and oral cancer monitoring. The items were more appropriate to discriminate low performing OHT and relatively ineffective to differentiate those with better performance. The thematic maps showed a direct relationship with HDI ($p < 0.0001$) and an indirect relationship with Gini index ($p= 0.0001$). In the third article, a comparative study of the performance of the ESB teams that participated in the last two PMAQ-AB evaluation cycles was carried out, analyzing 11 dental procedures coincident in both cycles. IRT was used to estimate the performance scores of the OHT. After obtaining the performance scores of the second and third cycles, these scores were compared by the Wilcoxon signed-rank test ($p \leq 0.05$) in Brazil and Brazilian regions. The findings indicate that there was improvement in the performance scores of the ESBs between the two cycles in Brazil and in the Brazilian regions. Northeast, Midwest, and North regions showing the greatest evolutions. However, regional differences still persist, and it is necessary to structure and improve public policies in order to expand and qualify the work process of oral health services, promoting a better regional distribution of the ESB in order to reduce inequalities.

Keywords: primary health care; dental health services; dental care team; health services research.

LISTA DE QUADROS

LISTA DE ABREVIATURAS E SIGLAS

AB	Atenção Básica
APS	Atenção Primária a Saúde
CAAE	Certificado de Apresentação para Apreciação Ética
CEO	Centro de Especialidades Odontológicas
COEP	Comitê de Ética em Pesquisa
CONASS	Conselho Nacional de Secretários de Saúde
CONASEMS	Conselho Nacional de Secretarias Municipais de Saúde
CPOD	Dentes Cariados, Perdidos e Obturados
ESB	Equipes de Saúde Bucal
ESF	Estratégia Saúde da Família
IBGE	Instituto Brasileiro de Geografia e Estatística
IDH	Índice de Desenvolvimento Humano
IEP	Instituições de Ensino e Pesquisa
LRPD	Laboratório Regional de Prótese Dentaria
MS	Ministério da Saúde
PMAQ-AB	Programa Nacional de Melhoria do Acesso e Qualidade da Atenção Básica
PNSB	Política Nacional de Saúde Bucal
PSF	Programa Saúde da Família
SUS	Sistema Único de Saúde
SPSS	Statistical Package for the Social Sciences
TRI	Teoria de Resposta ao Item
UBS	Unidades Básica de Saúde

SUMÁRIO

1 INTRODUÇÃO

O Sistema Único de Saúde (SUS) foi criado em 1988 pela Constituição Federal Brasileira, que determina que é dever do Estado garantir saúde a toda a população brasileira. O movimento se deu nos anos 1970 e 1980, por meio da articulação e engajamentos de diferentes grupos no movimento sanitário, com o objetivo de um sistema público que fosse capaz de solucionar os principais problemas no atendimento da população e defendendo o direito universal à saúde (PAIM *et al.*, 2011). O SUS segue a mesma doutrina e os mesmos princípios organizativos em todo o território nacional, sob a responsabilidade das três esferas autônomas de governo federal, estadual e municipal. Os princípios da universalidade, integralidade, equidade, descentralização, participação social e regionalização, norteiam o funcionamento do SUS e a prestação de serviços de saúde no Brasil.

A instituição do SUS guiou a mudança no modelo de saúde ofertado, passando de um modelo assistencial centrado na doença para um modelo de atenção integral à saúde, por meio da incorporação de ações de promoção, proteção e recuperação da saúde. A consolidação da mudança foi delineada através da implantação dos princípios da Atenção Primária à Saúde (APS) (BRASIL, 2011a).

A APS caracteriza-se por um conjunto de ações, no âmbito individual e coletivo, que abrange a promoção, proteção e recuperação da saúde. A APS tem o objetivo de desenvolver uma atenção integral que impacte na situação de saúde e autonomia das pessoas e nos determinantes e condicionantes de saúde das coletividades. Orienta-se pelos princípios e diretrizes do SUS a partir dos quais assume funções e características específicas (BRASIL, 2012a). Com o objetivo de proporcionar acesso universal e cuidado de saúde abrangente, a APS deve ser o contato e a porta de entrada preferencial dos usuários na rede de atenção à saúde (BRASIL, 2011a) além de coordenar e expandir cobertura para níveis mais complexos de cuidados (atenção secundária e terciária) e implementar ações para promoção da saúde e prevenção de doenças (PAIM *et al*., 2011).

Em 1994 o Ministério da Saúde desenvolveu o Programa Saúde da Família (PSF), mais tarde denominado como Estratégia de Saúde da Família (ESF) como estratégia de expansão, qualificação e consolidação da APS, por meio da reorientação no modelo de práticas apenas curativas para ações de, promoção, prevenção e recuperação da saúde, ampliando a resolutividade e impacto na situação de saúde

das pessoas e coletividades, por proporcionar uma prática clínica apoiada nas necessidades epidemiológicas da população (BRASIL, 2012a).

Em 2000, incluíram-se as Equipes de Saúde Bucal (ESB) na ESF, baseando as ações na territorialidade e o foco sobre os determinantes sociais da saúde e as necessidades epidemiológicas da população, com um modelo de vigilância em saúde de modo a garantir uma rede de atenção articulada e a integralidade das ações de saúde bucal (JUNQUEIRA *et al*., 2008).

A inserção das ESB permitiu ampliar as ações de saúde bucal e o acesso da população, o que se traduziu em melhora significativa nos níveis de saúde bucal da população, e pela geração de impactos positivos nos índices epidemiológicos de saúde bucal (OLIVEIRA *et al*., 2010).

As ESB tem como atribuições fundamentais: Participar do processo de territorialização e mapeamento da área de atuação da equipe, identificando grupos e indivíduos expostos a riscos; Realizar diagnóstico com a finalidade de obter o perfil epidemiológico para o planejamento e a programação em saúde bucal; Realizar os procedimentos clínicos da Atenção Básica em saúde bucal, incluindo atendimento das urgências e pequenas cirurgias ambulatoriais; Realizar a atenção integral em saúde bucal (promoção e proteção da saúde, prevenção de agravos, diagnóstico, tratamento, reabilitação e manutenção da saúde) individual e coletiva a população adscrita, de acordo com planejamento local, com resolubilidade; Realizar busca ativa e notificação de doenças, agravos e situações de importância local; Responsabilizar-se pela população adscrita, mantendo a coordenação do cuidado mesmo quando esta necessita de outros níveis de atenção; Participar das atividades de planejamento e avaliação das ações da ESF; Garantir a qualidade do registro das atividades nos sistemas de informação na Atenção Básica (BRASIL, 2008).

Em 2003, baseado nos dados obtidos pelo levantamento epidemiológico nacional das necessidades de saúde bucal (SB Brasil-2003), que revelava a necessidade do aumento do acesso aos serviços especializados de saúde bucal e a reorientação do modelo de cuidado, o Ministério da Saúde lançou a Política Nacional de Saúde Bucal (PNSB) – *Brasil Sorridente*, que ampliou e qualificou os serviços em saúde bucal, aumentando a resolutividade das ações, disponibilizando prótese dentária na rede de assistência básica e implantando os Centros de Especialidades Odontológicas (CEO) e Laboratórios Regionais de Prótese Dentária (LRPD) além de aumentar o incentivo financeiro para a implementação das ESB, melhorar a

infraestrutura dos consultórios e qualificar profissionais (JUNQUEIRA *et al*., 2008; PUCCA *et al*., 2009).

Em 2010, o SB-Brasil 2010 avaliou o impacto preliminar da PNSB na condição de saúde da população, revelando uma mudança positiva no perfil epidemiológico da população de 12-18 anos com declínio nos níveis de dentes cariados, perdidos e obturados (CPOD) e aumento de indivíduos livres de cárie. Entretanto, uma alta prevalência de oclusopatias foi observada nesta população. Por outro lado, apesar do aumento do acesso aos serviços, adultos e idosos ainda apresentavam níveis CPOD notavelmente mais altos que os recomendados pela Organização Mundial da Saúde (OMS) e alto índice de edentulismo, o que motivou a inserção das especialidades de ortodontia e implantodontia nos Centros de Especialidades Odontológicas (CEO) (BRASIL, 2012b).

Durante muitos anos, as ESB atuaram de maneira afastada do processo de organização dos demais serviços da unidade de saúde. Atualmente, essa visão vem sendo transformada, integrando uma maior participação da saúde bucal nos serviços de, contribuindo para o crescimento e desenvolvimento da equipe como um todo. Esta nova forma de se fazer às ações cotidianas representou um avanço significativo na reorientação do processo de trabalho, com aumento de cobertura, de efetividade na resposta às demandas da população e de alcance de medidas de caráter coletivo.

Apesar dos grandes avanços alcançados e demonstrados por meio dos levantamentos epidemiológicos como a ampliação dos serviços, promoção da equidade e melhoria dos indicadores de saúde, grandes esforços ainda são necessários para mudar o perfil epidemiológico da população e garantir saúde bucal para todos os brasileiros, principalmente relacionados ao financiamento, planejamento e organização das práticas de cuidado, gestão do trabalho e educação permanente dos profissionais, coordenação do cuidado mediante a dificuldade de garantia do acesso aos demais níveis de atenção e construção da integralidade da atenção (VIEIRA-MEYER *et al*.,2020).

A saúde bucal ainda apresenta muitos desafios a superar para atingir os princípios esperados pela APS como relações de trabalho precárias, dificuldade em integrar as abordagens de atenção primária aos encaminhamentos a atenção secundária, excesso de demanda, dificuldade em planejar e avaliar ações, proporcionar capacitação e educação continuada dos profissionais e dificuldades na

efetivação da interprofissionalidade para que seja possível melhorar a qualidade dos cuidados prestados à população (ANJOS *et al*., 2011).

Para a superação destes desafios e aperfeiçoamento da gestão dos serviços de saúde bucal na APS, a avaliação em saúde revela-se um instrumento de apoio à gestão pela sua capacidade de melhorar a qualidade da tomada de decisão, produzindo informações capazes de apoiar uma intervenção de forma oportuna (TANAKA &TAMAKI,2012).

Com a expressiva expansão da rede de saúde bucal brasileira na APS, torna-se importante retratar como as ESB têm prestado serviços à população. Neste contexto, a avaliação da qualidade dos serviços da APS no Brasil é desejável, visto que a avaliação é capaz de fornecer informações sobre adequação, efeitos e custos associados aos programas ou serviços de saúde e, assim, subsidiar as ações, aperfeiçoando o processo de tomada de decisão em relação às práticas de saúde e as políticas apropriadas ao setor (MICLOS *et al*., 2017).

A avaliação em saúde tem sido cada vez mais valorizada no setor público devido à crescente necessidade de informação sobre a eficácia e efetividade do funcionamento dos serviços e da necessidade de controle dos gastos públicos em saúde. Além disso, mudanças nos procedimentos de gestão do SUS, maior complexidade do perfil epidemiológico da população, incorporação de novas tecnologias e ampliação da oferta e da complexidade dos serviços também são fatores que justificam o interesse em avaliações de políticas, programas e serviços de saúde no Brasil (GOES *et al*., 2012).

Uma das diretrizes atuais do Ministério da Saúde é executar a gestão pública com base na indução, monitoramento e avaliação de processos e resultados mensuráveis, garantindo acesso e qualidade da atenção em saúde a toda a população (BRASIL, 2012b).

Partindo do pressuposto de utilizar a avaliação como instrumento para a melhoria da qualidade, o Ministério da Saúde por meio da Portaria 1.654 GM/MS de 2011 lançou, como componente da nova Política Nacional de Atenção Básica (PNAB), o “Programa Nacional de Melhoria do Acesso e Qualidade da Atenção Básica – PMAQ-AB” (BRASIL, 2011b).

Embora não de forma explícita, o desenho do PMAQ-AB baseou-se nos princípios da tríade Donabediana, composta pelos aspectos de Estrutura, Processo e Resultado. Essa tríade oferece uma abordagem abrangente para avaliar a qualidade

dos serviços de saúde e é frequentemente empregada como diretriz para aprimorar continuamente os cuidados de saúde.

O Programa teve como principal objetivo induzir a ampliação do acesso e a melhoria da qualidade da APS, ampliando o impacto das ações sobre as condições de saúde da população; promovendo a qualidade e inovação na gestão da APS; institucionalizando uma cultura de avaliação no SUS e estimulando o foco da APS no usuário (BRASIL, 2012b).

A atenção primária exerce um papel fundamental na organização das redes de cuidados de saúde, estabelecendo conexões entre diversos serviços, profissionais e níveis de assistência. Isso é feito para assegurar que o cuidado de saúde seja completo e contínuo, tornando-a um ponto estratégico para coordenar, fornecer cuidados integrais e facilitar a interação entre os diversos níveis de atendimento. O PMAQ-AB foi uma estratégia que sintetiza este esforço de afirmação da APS como porta de entrada acolhedora e resolutiva para as necessidades de saúde e a criação das condições concretas para que ela garanta e coordene a continuidade do cuidado nesta rede (PINTO *et al.,* 2014).

O PMAQ-AB foi fruto de um importante processo de negociação e pactuação das três esferas de gestão do SUS (Ministério da Saúde, gestores municipais e estaduais) que debateram e formularam soluções para viabilizar um desenho do programa que possibilitasse a ampliação do acesso e melhoria da qualidade da APS em todo o Brasil, com o intuito de superar os desafios para a qualificação da APS, como questões relacionadas à precariedade da estrutura física e condições pouco acolhedoras das Unidades Básicas de Saúde (UBS); inadequadas condições de trabalho para os profissionais, comprometendo sua capacidade de intervenção e satisfação com o trabalho; necessidade de qualificação dos processos de trabalho; baixa integralidade e resolutividade das práticas e financiamento insuficiente e inadequado da APS (BRASIL, 2012b).

O programa objetivou obter um padrão de qualidade dos serviços que fosse comparável nacional, regional e localmente, para permitir maior efetividade das ações governamentais voltadas à APS, bem como acompanhar os resultados alcançados para medir os efeitos das políticas de saúde, garantindo a transparência dos processos de gestão do SUS, publicar os resultados alcançados e fortalecer o controle social.

O PMAQ-AB foi lançado em 2011. O 1º ciclo durou de 2011 a 2012, e contou com a adesão de 3.965 municípios, o 2º ciclo de 2013 a 2014, e contou com a adesão de 5.073 municípios. Já o 3º ciclo durou de 2017 a 2018 (WACHS *et al*.,2022) e permitiu a participação de todas as equipes de saúde da APS, independentemente do modo pelo qual se organizam desde de que se encontrem em conformidade com a Política Nacional de Atenção Básica (PNAB) (BRASIL, 2017) e contou com a adesão de 5.324 municípios.

O PMAQ-AB surgiu como mais uma possibilidade de avaliação de desempenho das ESB. Os dados obtidos, resultantes dos ciclos de avaliações das equipes, constituem excelente fonte para ilustrar as ações de APS realizadas pelas ESB no Brasil e, por meio delas, tentar compreender aspectos que levam a diferentes desempenhos das ESB.

O PMAQ-AB tem permitido reflexões e inovações nas práticas cotidianas de avaliação e auto avaliação, que fomentam planejamento de melhorias pelas equipes, comprometendo-se assim com mudanças na infraestrutura e no processo de trabalho (VIEIRA-MEYER *et al*.,2020)

Reis *et al.* (2015) e Fagundes *et al*. (2018) utilizando dados do primeiro ciclo do PMAQ-AB referentes às ações de saúde bucal identificaram que a maioria das ESB realizavam procedimentos preventivos individuais, procedimentos periodontais básicos, extrações e emergências. Por outro lado, ações relacionadas ao câncer bucal e à reabilitação com próteses foram observadas com menor frequência.

Da mesma forma, Mendes *et al*. (2017) demonstraram através de dados do 2° ciclo do PMAQ- AB, que a maioria das ESB realiza uma variedade de procedimentos odontológicos básicos, incluindo procedimentos preventivos, restauradores, endodônticos e cirúrgicos individuais. Porém ainda há dificuldades no encaminhamento de casos de câncer bucal, uma vez que poucas ESB mantêm registros adequados. Em relação às próteses dentárias, poucas realizam impressões, cimentação e consulta para avaliação de próteses dentárias.

Ribeiro *et al.* (2021) analisaram indicadores de acesso aos serviços de saúde bucal nos dois primeiros ciclos PMAQ-AB, verificaram se ocorreram alterações nos serviços e concluíram que em relação aos procedimentos odontológicos básicos ofertados na APS, não houve uma diferença estatisticamente significativa quando comparados o 1º e o 2º ciclos do PMAQ-AB.

Avaliar a disponibilidade de procedimentos na APS é uma das estratégias de avaliação das políticas públicas de saúde, sendo um componente para a avaliação aos serviços, representando sua interação com o usuário (TANAKA, 2011).

Estudos avaliativos de saúde que analisem o desempenho dos serviços em saúde são necessários para ofertar sistemas de saúde cada vez mais estruturados e de qualidade, além de demonstrar o impacto das políticas públicas instituídas no desempenho dos serviços de saúde.

Os dados gerados pelo PMAQ-AB são uma importante fonte de dados para realização de pesquisas na área da saúde, por considerar os diversos atores deste serviço, por ser um programa de alcance nacional e pela magnitude de variáveis analisadas (HATISUKA *et al*.,2021)

Os dados do 3º ciclo do PMAQ referentes aos procedimentos odontológicos realizados pelas ESB ainda não foram analisados. Além disso, não há na literatura um estudo que avalie o desempenho das equipes comparativamente nos últimos dois ciclos do programa.

Ante ao exposto, este estudo teve como objetivo descrever e analisar o desempenho das ESB participantes do 3º ciclo do PMAQ-AB por meio dos procedimentos odontológicos realizados na APS e comparar este desempenho entre os ciclos.

2 OBJETIVOS

2.1 Objetivos gerais

Descrever e analisar o desempenho das ESB participantes do 3º ciclo do Programa Nacional de Melhoria do Acesso e Qualidade da Atenção Básica - PMAQ-AB, por meio dos procedimentos odontológicos realizados, e comparar este desempenho entre os ciclos.

2.1 Objetivos específicos

Descrever e analisar as ações de APS realizados pelas ESB participantes do 3º ciclo do PMAQ-AB de acordo com as cinco regiões brasileiras;

Avaliar o desempenho das ESB, de acordo com os procedimentos odontológicos da APS no 3º ciclo do PMAQ-AB e fatores contextuais associados;

Comparar o desempenho das ESB atuantes na APS brasileira, nos dois últimos ciclos do PMAQ-AB de acordo com as cinco regiões brasileiras.

3 METODOLOGIA EXPANDIDA

3.1 Considerações éticas

Toda pesquisa que envolva seres humanos, direta ou indiretamente, incluindo manejo de informações ou materiais, deve atender às exigências éticas e científicas fundamentais, de acordo com a Resolução 466/12 (BRASIL, 2013), que trata de pesquisas que envolvam seres humanos.

Sendo assim, os bancos de dados utilizados para esta pesquisa foram aprovados pelo Comitê de Ética em Pesquisa da Universidade Federal de Minas Gerais (COEP-UFMG). Foram analisados dados públicos do Ministério da Saúde do Brasil e IBGE e nenhum participante será identificado em qualquer etapa desta pesquisa (ANEXOS A, B e C).

3.2 Delineamento do estudo

Trata-se de um estudo longitudinal que utilizou o banco de dados secundários, pertencentes ao componente Avaliação Externa dos dois últimos ciclos do Programa Nacional de Melhoria do Acesso e da Qualidade da Atenção Básica, no período de 2013 a 2019.

No 3º ciclo do PMAQ-AB, que ocorreu entre 2015 e 2019, foram avaliadas 25.090 ESB's. Destas, 2.097 (8,4%) foram desqualificadas pelos critérios de avaliação do PMAQ-AB, uma vez que não seguiram as recomendações do programa, tais como um sistema adequado de vigilância da saúde bucal e a presença do dentista e consultório odontológico na UBS, resultando numa amostra de 22.993 ESBs.

3.3 Coleta de dados

O PMAQ-AB é composto por quatro fases que se complementam e formam um ciclo contínuo de avaliação, (1) adesão e contratualização, (2) desenvolvimento, (3) avaliação externa e (4) recontratualização. Foram utilizados, no presente estudo, dados obtidos na fase de avaliação externa do PMAQ-AB, referentes ao Módulo VI – Entrevista com Profissional da ESB e verificação de documentos na Unidade de Saúde, Dimensão VI.7 - Organização da Agenda e Oferta de Ações da Equipe, Subdimensões VI 7.5 - Procedimentos que a Equipe de Saúde Bucal realiza.

Durante a Avaliação Externa foram coletadas informações para análise das condições de acesso e de qualidade das ESB participantes do programa. Para isso, foi um criado instrumento avaliativo contendo padrões de qualidade estabelecidos de acordo com as normas, protocolos, princípios e diretrizes que organizam ações e práticas, conhecimentos técnicos e científicos atuais, considerando a competência dos atores envolvidos (BRASIL, 2017).

O Ministério da Saúde (MS) contou com o apoio de 46 Instituições de Ensino e Pesquisa (IEP) brasileiras na confecção do instrumento de avaliação, organização e desenvolvimento dos trabalhos de campo, incluindo a seleção, capacitação das equipes de avaliadores da qualidade que aplicaram o instrumento de avaliação (BRASIL, 2017).

A avaliação externa iniciou com contato da equipe de avaliadores com a gestão municipal para aviso da chegada da equipe e planejamento do roteiro de visita às unidades. Em seguida, ocorreram as visitas às UBS para a coleta de dados utilizando *tablets*, que continham um programa do MS desenhado para o PMAQ-AB, com os parâmetros de qualidade que deveriam ser observados e avaliados. Após a coleta, as IEP realizaram a validação dos dados e envio para banco de dados centralizado no MS que em seguida juntamente com o Conselho Nacional de Secretários de Saúde (CONASS) e Conselho Nacional de Secretarias Municipais de Saúde (CONASEMS) certificaram as equipes de acordo com os parâmetros avaliados.

3.4 Variáveis analisadas

As análises deste estudo resultaram em 03 artigos científicos. No primeiro artigo foram analisadas as variáveis que tratavam do atendimento de demanda espontânea e execução de procedimentos básicos em odontologia do 3º ciclo do PMAQ-AB, como exodontia, restaurações de amálgama e resina, aplicação de flúor e selantes, além de procedimentos de prevenção e acompanhamento dos casos de câncer de boca e a reabilitação por meio de prótese dentária realizada na atenção básica.

Um total de 26 procedimentos realizados pelas ESB foram analisados, e em sua maioria eram dicotómicos (sim/não) (QUADRO 01).

Quadro 1 - Variáveis selecionadas do 3º Ciclo do PMAQ-AB

Organização da Agenda e Oferta de Ações da Equipe		
Subdimensão	**Parâmetro avaliado**	**Descrição**
No atendimento à demanda espontânea, a Equipe de Saúde Bucal realiza:	Atendimento de urgência (drenagem de abscesso, sutura de ferimentos por trauma, acesso à polpa dentária, pulpotomia, tratamento de alveolite, tratamento inicial de dente traumatizado)	Sim / Não
	Prescrição de receitas de medicamentos	Sim / Não
	Orientação	Sim / Não
No atendimento clínico, a Equipe de Saúde Bucal realiza:	Aplicação de selante ionomérico	Sim/Não
	Aplicação tópica de flúor	Sim/Não
	Exodontia de dente decíduo	Sim/Não
	Exodontia de dente permanente	Sim/Não
	Ulotomia/ Ulectomia	Sim/Não
	Raspagem, alisamento e polimento supragengival	Sim/Não
	Raspagem, alisamento e polimento subgengival	Sim/Não
	Restaurações dentárias de amálgama	Sim/Não
	Restaurações dentárias de resina	Sim/Não
	Restaurações dentárias de ionômero	Sim/Não
	Moldagem para prótese	Sim/Não
	Instalação de prótese	Sim/Não
	Cimentação de prótese	Sim/Não
Atenção ao Câncer de Boca		
Subdimensão	**Parâmetro avaliado**	**Descrição**
	A Equipe de Saúde Bucal realiza ações de prevenção e diagnóstico do câncer de boca?	Sim/Não
Quais ações são realizadas?	Orientação sobre o uso do tabaco	Sim/Não
	Orientação sobre o uso do álcool e outras drogas	Sim/Não
	Orientação sobre a prevenção da exposição à radiação solar	Sim/Não
	Busca ativa de lesões potencialmente cancerizáveis e de casos na comunidade	Sim/Não
	Exame sistemático das mucosas orais	Sim/Não

	A Equipe de Saúde Bucal realiza biópsias, na UBS, para diagnóstico de câncer de boca?	Sim/Não
	A Equipe de Saúde Bucal possui registro dos pacientes com suspeita de câncer de boca que foram biopsiados na UBS ou encaminhados para o serviço de referência?	Sim/Não
	A Equipe de Saúde Bucal monitora os pacientes submetidos à biópsia para avaliação do resultado do exame?	Sim/Não
	Existe documento que comprove?	Sim/Não
	Após a referência do usuário para o tratamento, a Equipe de Saúde Bucal acompanha e monitora a continuidade do cuidado?	Sim/Não

Fonte: Elaborado pela autora, 2023.

Para o segundo artigo, também utilizando dados do 3º ciclo do PMAQ-AB, a variável dependente (desfecho do estudo) foi o desempenho das ESB, estimado a partir do relato de realização de alguns procedimentos odontológicos realizados na APS.

Para tanto, selecionou-se 21 procedimentos relacionados à demanda espontânea, procedimentos preventivos, cirúrgicos, restauradores, protéticos e de diagnóstico e prevenção do câncer de boca.

As três perguntas relacionadas a próteses dentárias foram agrupadas em uma única variável. O mesmo foi feito para as sete perguntas relacionadas à prevenção ou diagnóstico do câncer de boca, resultando, em treze itens. Para cada procedimento (item), o desempenho das equipes foi dicotomizado em *não realizaram nenhum procedimento* ou *realizaram algum tipo de procedimento.*

Para os itens relacionados com a prevenção e diagnóstico do câncer de boca, foram desenvolvidas três categorias para mensuração: *Nenhuma* – ESB não realizam qualquer ação; *Algumas* – ESB realizam algumas das sete ações; e *Todas* - ESB realizam todas as sete ações.

O modelo de Teoria de Resposta ao Item (TRI) foi utilizado para estimar as pontuações de desempenho das ESB, com base nos 13 itens resultantes.

Quadro 2 - Variáveis utilizadas para estimar o desempenho das ESB participantes do 3º Ciclo do PMAQ-AB

Parâmetro avaliado	Descrição
Atendimento a demanda espontânea	Sim/Não
Aplicação de selante ionomérico	Sim/Não
Aplicação tópica de flúor	Sim/Não
Exodontia de dente deciduo	Sim/Não
Exodontia de dente permanente	Sim/Não
Ulotomia/ Ulectomia	Sim/Não
Raspagem, alisamento e polimento supragengival	Sim/Não
Raspagem, alisamento e polimento subgengival	Sim/Não
Restaurações dentárias de amálgama	Sim/Não
Restaurações dentárias de resina	Sim/Não
Restaurações em cimento ionômero de vidro	Sim/Não
Procedimentos de prótese dentária	Sim/Não
Prevenção e Diagnóstico de câncer de boca	Nenhuma / Algumas / Todas

Fonte: Elaborado pela autora, 2023.

Para o terceiro artigo, na análise comparativa, foram consideradas as ESB que participaram dos dois últimos ciclos de avaliação do PMAQ-AB, bem como procedimentos odontológicos realizados na APS também coincidentes nestes ciclos (QUADRO 3), para efeitos de comparação de desempenho ao longo dos ciclos.

As equipes que participaram dos dois ciclos foram pareadas utilizando o INE (Identificador Nacional de Equipe). O INE é um código de identificação individual de equipes de base nacional, e objetiva acompanhar historicamente a movimentação de cada equipe pelos estabelecimentos do município e também acompanhar os profissionais que ali atuam.

O pareamento feito pelo INE entre os diferentes ciclos teve como propósito permitir a comparação das mesmas equipes em diferentes momentos de avaliação. Isso foi feito para avaliar se houve alterações no desempenho ao longo do tempo.

Os dados do primeiro ciclo não puderam ser incluídos nesta análise. A base de dados do primeiro ciclo não continha as informações do INE, o que impediu o pareamento das equipes para comparação entre os três ciclos. Assim, a amostra final incluiu apenas as equipes, que participaram do segundo ciclo e do terceiro ciclo do PMAQ-AB.

Quadro 3 - Variáveis selecionadas para comparação entre o segundo e terceiros ciclos do PMAQ-AB

Oferta e resolubilidade das ações da Equipe de Saúde Bucal		
Subdimensão	**Parâmetro avaliado**	**Descrição**
A Equipe de Saúde Bucal realiza os seguintes procedimentos na Unidade de Saúde?	Aplicação tópica de flúor	Sim/Não
	Exodontia de dente decíduo	Sim/Não
	Exodontia de dente permanente	Sim/Não
	Ulotomia/Ulectomia	Sim/Não
	Raspagem, alisamento e polimento supragengival	Sim/Não
	Restauração de amálgama	Sim/Não
	Restauração de resina composta	Sim/Não
Acesso à prótese dentária		
Subdimensão	**Parâmetro avaliado**	**Descrição**
Equipe de Saúde Bucal realiza as seguintes etapas de confecção de próteses dentárias na Unidade de Saúde:	Moldagem anatômica e funcional	Sim/Não
	Instalação da prótese dentária	Sim/Não
Atenção ao Câncer de Boca		
Subdimensão	**Parâmetro avaliado**	**Descrição**
Geral	A Equipe de Saúde Bucal realiza ações de prevenção e diagnóstico do câncer de boca?	Sim/Não
	A Equipe de Saúde Bucal realiza biópsias, na UBS, para diagnóstico de câncer de boca?	Sim/Não

Fonte: Elaborado pela autora, 2023.

3.5 Análises de dados

Inicialmente os dados selecionados do 3º Ciclo foram analisados no programa *IBM Statistical Package for Social Sciences* (SPSS), versão 25.0 (*IBM SPSS Statistics for Windows,* Armonk, NY) por meio de análise descritiva, de medidas de tendência central e de variabilidade com o objetivo de identificar os resultados das ESB em relação às ações realizadas na APS (REIS *et al.*, 2015; MENDES et al., 2017).

No primeiro artigo, para cada procedimento realizado foi atribuída uma pontuação (escore) a cada ESB, sendo a pontuação final a soma da quantidade de procedimentos realizados por cada equipe (de 0 a 26 pontos), por exemplo, se a pontuação de uma ESB foi 20, significa que essa ESB realizava 20 dos 26 procedimentos avaliados.

Em seguida, as ESBs foram analisadas de acordo com as regiões geográficas do Brasil (Norte, Nordeste, Centro-Oeste, Sul e Sudeste), tendo sido calculado o escore de cada região, para em seguida compara-los, objetivando identificar possíveis diferenças regionais dos achados.

Para o segundo artigo, foram avaliados treze procedimentos odontológicos realizados na APS, e determinou-se, como variável dependente, o 'desempenho das ESB', uma pontuação atribuída a cada ESB.

A Teoria da Resposta ao Item (TRI) foi utilizada para estimar as pontuações de desempenho. A TRI não se limita à obtenção da mensuração de interesse, nesse estudo o desempenho do serviço, mas se estende à obtenção de uma análise mais detalhada das características de cada item usado para construir a medição (REIS *et al.,* 2017).

O modelo da TRI relaciona a probabilidade da resposta de um indivíduo a um item e seu traço latente. Por traço latente denomina-se uma característica que não pode ser mensurada de forma direta, como atitude, satisfação e proficiência. Ou seja, uma variável não observável, que será estimada com base nas respostas dadas a cada um dos itens considerados pelos respondentes participantes do estudo (BHAKTA *et al.,* 2005; BOURION-BÉDÈS *et al.,* 2015).

A TRI parte do pressuposto de que o traço latente representa a variável fundamental que influencia como os indivíduos respondem aos itens. Cada equipe possui um nível único desse traço latente, que determina como elas respondem às questões. Esse conceito é fundamental para entender o desempenho individual e as diferenças no que está sendo avaliado. Neste estudo, o traço latente, obtido por meio da aplicação da TRI, refere-se ao desempenho das Equipes de Saúde Bucal (ESB) nos procedimentos odontológicos da Atenção Primária à Saúde (APS), realizados por essas equipes durante o terceiro ciclo do PMAQ-AB.

Foram realizadas análises descritivas dos procedimentos odontológicos. Para confirmar a viabilidade da aplicação da TRI, o primeiro valor foi calculado a partir da decomposição da matriz de correlação polcórica, verificando o seu domínio. A consistência interna da escala foi também avaliada utilizando o alfa de Cronbach.

O modelo da TRI permite uma análise mais profunda das variáveis utilizadas para construir a medida, incluindo o nível de dificuldade e a capacidade de discriminação, uma vez que não é o número de procedimentos realizados que

determina o desempenho da ESB, mas o nível de dificuldade e a capacidade de discriminação entre itens.

O parâmetro de discriminação consiste na capacidade do item de distinguir entre equipes com diferentes habilidades. Quanto maior o valor deste parâmetro, mais o item é capaz de detectar diferenças entre equipes. O parâmetro de dificuldade é a capacidade mínima de que uma equipe necessita para ter uma probabilidade de 0,5 (50%) para realizar o procedimento.

O parâmetro de discriminação e o nível de dificuldade de cada procedimento avaliado foram calculados pela TRI e, com base nos resultados, cada ESB recebeu uma pontuação.

Além da análise individual de cada item da lista de procedimentos odontológicos selecionados, quanto ao seu nível de dificuldade e parâmetro de discriminação, o modelo da TRI forneceu uma nota de classificação, para cada ESB, denominada escore, de acordo com as respostas dadas. Cada item teve um peso diferente na estimativa desse escore, estimado em função dos parâmetros de dificuldade e discriminação. Esse escore foi a variável dependente do estudo, sendo denominado “desempenho das ESB”.

Para cada procedimento (item), o desempenho das ESB foi dicotomizado entre as que que não realizavam o procedimento e as que realizavam o procedimento. Para as ações relacionadas com a prevenção e diagnóstico do câncer, três categorias foram criadas as que não realizavam nenhuma ação, as realizam algumas das sete ações, mas não todas; e as que realizam todas as sete ações.

As pontuações atribuídas a cada equipe podem teoricamente variar de -4 a +4. As ESB foram classificadas de acordo com o seu desempenho, com base nos pontos de corte de quartil. Além disso, a curva de informação do teste foi obtida para identificar o intervalo de pontuação em que o presente instrumento fornece informações.

Para a análise da TRI e modelagem das variáveis latentes utilizou-se o Stata Software (StataCorp. 2015. Stata Statistical Software: Versão 14. Versão Universitária, TX: StataCorp LP), pacote ltm do software R v. 4.0.2 (R Core Team, 2019).

Após determinar as pontuações de desempenho, foi realizada a análise de correlação entre as pontuações de desempenho e a mediana das variáveis contextuais - Índice de Desenvolvimento Humano (IDH) e Índice de Gini nas regiões

intermediárias brasileiras, por mapas temáticos e pela correlação de Pearson ($p<0,05$), utilizando o software R para análise.

O Índice de Desenvolvimento Humano (IDH), estabelecido pelo Programa das Nações Unidas para o Desenvolvimento (PNUD) em 1990, é um indicador abrangente utilizado para mensurar o bem-estar e o progresso humano de uma população. Ele desempenha um papel crucial ao permitir comparações de desenvolvimento entre diversas regiões e países. Esse índice é calculado considerando três aspectos essenciais: saúde, educação e padrão de vida. Cada uma dessas dimensões é avaliada em uma escala própria e, em seguida, combinadas para gerar um único valor de IDH, que varia de 0 a 1. Quanto mais próximo de 1 for o valor, maior é o nível de desenvolvimento humano. O IDH oferece insights sobre o avanço das populações e pode direcionar a formulação de políticas públicas voltadas para o desenvolvimento.

O Índice de Gini é uma medida amplamente empregada por economistas, pesquisadores sociais e responsáveis pela elaboração de políticas públicas, com o propósito de compreender e comparar desigualdades em distintas áreas geográficas, países ou grupos populacionais. Esse índice permite avaliar o grau de concentração ou dispersão dos recursos econômicos dentro de uma população. Sua escala varia de 0 a 1, onde 0 indica uma distribuição perfeitamente igualitária e 1 representa uma distribuição extremamente desigual.

Em 2017, o Instituto Brasileiro de Geografia e Estatística (IBGE) apresentou uma nova divisão regional do país levando em consideração vínculos, classificação hierárquica e articulação entre seus municípios. As regiões geográficas intermediárias correspondem a uma revisão das antigas mesorregiões, que estavam em vigor desde a divisão de 1989. As regiões geográficas imediatas, por sua vez, substituíram as microrregiões (IBGE, 2017).

O Brasil tem 133 Regiões Geográficas Intermediárias, 510 Regiões Geográficas Imediatas, e 5.570 municípios, divididos em cinco regiões geográficas: Norte, Nordeste, Sudeste, Sul e Centro-Oeste.

As Regiões Geográficas Intermediárias correspondem a uma escala intermediária entre as regiões e as Regiões Geográficas Imediatas. As Regiões Geográficas Intermediárias organizam o território, articulando as Regiões Geográficas Imediatas através de um polo hierárquico superior diferenciado, considerando fluxos de gestão pública, e a existência de funções urbanas mais complexas.

O terceiro artigo fez uma comparação de onze procedimentos executados pelas ESB nos dois últimos ciclos do programa, e a comparação destes resultados de acordo com as regiões brasileiras.

Assim como no segundo artigo, foram realizadas análises descritivas dos procedimentos odontológicos. Para confirmar a viabilidade da aplicação da TRI, o primeiro valor foi calculado a partir da decomposição da matriz de correlação polícórica, verificando o seu domínio. A consistência interna da escala também foi avaliada utilizando o alfa de Cronbach.

Utilizando a TRI, calculou-se separadamente os escores de desempenho das ESB que participaram de cada ciclo de avaliação do PMAQ-AB, através dos procedimentos selecionados, bem como os parâmetros de discriminação e dificuldade.

Em seguida, comparou-se os escores obtidos, para determinar se houve mudanças no desempenho das ESB participantes do segundo e terceiro ciclos do PMAQ-AB no Brasil e regiões brasileiras. Esses escores foram comparados por meio do teste Wilcoxon ($p \leq 0,05$), utilizando o software R v. 4.0.2 (R Core Team, 2019).

4 ARTIGOS

Três artigos científicos resultantes das análises dos dados selecionados compõem este Capítulo.

4.1 Artigo 01

Oral health in Brazil: what were the dental procedures performed in Primary Health Care?

Dental procedures performed in Brazil

Artigo publicado na *Plos One* em Janeiro de 2022.

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PLOS ONE

RESEARCH ARTICLE

Oral health in Brazil: What were the dental procedures performed in Primary Health Care?

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Abstract

This cross-sectional study aims to describe the primary dental care procedures performed by Oral Health Teams (OHTs), adhering to the third cycle of the "National Program for Improving Access and Quality of Primary Care" (PMAQ-AB) in Brazil. A descriptive analysis was performed through 26 dental procedures, including spontaneous, preventive, restorative/prosthetic and surgical procedures, and actions of cancer monitoring. Each conducted procedure assigned a score to the OHT, the final score being the sum of the number of procedures performed by the OHTs. These scores were then compared among the geographic regions of the country. Most OHTs perform basic dental procedures, such as supragingival scaling, root planning and coronal polishing (98.1%), composite filling (99.0%), and permanent tooth extraction (98.6%). The frequency related to dental prosthesis and monitoring of oral cancer decreased. Only 12.9% of the OHTs carries out biopsies, 30.9% monitor patients undergoing biopsy, 15.1% carry out impression for prostheses, and 13.6% carry out prostheses' installation. The scores reveal that OHT's performed, on average, 19.45 (±3.16) dental procedures. The OHTs in the South, Southeast, and Northeast had a higher number of primary dental procedures, while the teams in the North and Midwest performed, on average, fewer procedures. The Brazilian regions with the highest dental need have the lowest number of dental procedures. It is necessary to increase the range of procedures offered by OHT and reduce regional inequalities, adapting to the needs of the population in order to achieve comprehensive oral health.

Introduction

Primary Health Care (PHC) in Brazil is considered the entry point for the user of the Brazilian National Health System (SUS in Portuguese). The evaluation of this level is strategic to

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identifying the persistent fragilities that hinder its organization and operation towards the desired resolubility for the service [1].

To reorganize oral health actions in primary health care, the Brazilian Ministry of Health proposed the inclusion of Oral Health Teams (OHT) in the Family Health Strategy (FSH). FHS is the starting point for the application of the principles of PHC in Brazilian oral health. The result was the expansion of access to dental care in Brazil, [2,3] with improved dental facilities in the units and a better qualification of professionals [4]. In Brazil, there are currently 27,564 OHTs distributed throughout 5,032 municipalities [5].

The expansion of access to oral health has revealed the need to evaluate services in order to improve the quality of care provided to the population. Issues related to the quality of management and team practices assumed a more relevant position while it reduced the concern only with the expansion of services [6].

In 2011, the Brazilian Ministry of Health (MofH) launched the National Program for Improving Access and Quality of Primary Care (PMAQ-AB in Portuguese) [7]. The PMAQ-AB has the aim to increase access and improve the quality of health care, providing a national, regional, and local quality standard. This program is the largest health service evaluation program ever instituted in the country [8].

The PMAQ-AB is organized in three phases; adhesion and agreement, certification and re-agreement, and one strategic transverse axis of development [9], forming continuous evaluation cycles. In 2018, the 3rd cycle was finished. A significant increase was observed in the participation of OHTs over the years in PMAQ-AB. In the 1st (2011–2012), 2nd (2013–2014), and 3rd (2017–2018) cycles, the number of OHTs assessed were 12,403; 18,114, and 25,090, respectively.

After three cycles of PMAQ-AB, and approximately seven years of evaluation of dental services, studies have evaluated the procedures performed at PHC by OHTs. Reis et al. [10] and Neves et al. [11], using data from the 1st cycle, showed that most OHTs performed emergency, preventive, restorative and surgical procedures; however, for oral cancer and prosthetic procedures, a failure was found in both supply and execution. In the 2nd cycle, an improvement was observed in the external evaluation instrument with a greater number of variables related to the structure and work process [12]. However, Mendes et al. [13] revealed that failures related to the prevention and detection of oral cancer and the manufacture of prostheses still persisted. The evaluation of the 3rd cycle may indicate if there were advances in the provision of PHC procedures in oral health and changes in the performance of the OHTs, providing data for the improvement and development of services.

Brazil has a territory with a continental dimension and is divided into five regions: South, Southeast, Midwest, Northeast and North. This territorial extension leads to geographical socioeconomic inequalities with impact on health services and consequently on the population ´s health [14].

The present study aims to describe the procedures of primary dental health care performed by OHTs that adhered to the 3rd cycle of the PMAQ-AB among Brazilian regions. The null hypothesis of this study is that there is no difference in the PHC procedures performed by OHT's among the five Brazilian regions.

Methods

This study was approved by the Research Ethics Committee of Universidade Federal de Minas Gerais (UFMG), logged under protocol number 02396512.8.0000.5149. No participant was identified at any stage of this study, as it dealt with secondary and public data of the Brazilian MofH. This is a cross-sectional descriptive study that used secondary data from the third cycle of the PMAQ-AB, related to the procedures performed by OHTs that complied with the program.

In the 3rd cycle of PMAQ-AB, which occurred between 2017 and 2018, 25,090 OHTs were assessed. Of these, 2,097 (8.4%) were disqualified by the PMAQ-AB evaluation criteria, as they did not follow the program's recommendations, such as an adequate oral health surveillance system and the presence of the dentist and dental equipment in the PHC unit, resulting in a sample of 22,993 OHTs.

The data were collected during the external evaluation phase, which is characterized by a visit of program evaluators to the PHC units. An instrument, developed for this purpose by MofH in partnership with Brazilian teaching and research institutions, was used to interview the dental professionals and was applied by a trained team. At the time of the interview, the documents were verified to check the quality standards established according to norms, protocols, principles, and guidelines for the organization of actions and practices. The answers were recorded on tablets, using a program developed for PMAQ-AB. After data collection, the partner institutions performed the data validation and sent the results to the MofH's central database.

For this study, data were obtained from the interview conducted with the OHT and verification of documents in the PHC, through Module VI—Oral Health Professional Interview; section VI.7 - Organization of team's agenda and actions offered and section VI.11 - oral cancer care. Questions about 26 procedures performed by OHTs, mostly dichotomous (yes/no), were evaluated. The questions included response to spontaneous demand (subsection VI.7.4); preventive, restorative, surgical and procedures related to the manufacture and installation of dental prostheses (subsection VI.7.5); and actions of cancer monitoring (subsections VI.11.1, VI.11.2, VI.11.3, VI.11.6, VI.11.6/1, VI.11.7, VI.11.9).

Each procedure performed attributed a score to each OHT, with the final score being the sum of the quantity of procedures performed by each OHT (from 0 to 26 points). For example, if an OHT score was 18, it meant that this OHT carries out 18 of the 26 procedures evaluated. After this, the OHTs were divided into five geographic regions (North, Northeast, Midwest, South, and Southeast) in Brazil, and the score for each region was calculated.

The data were analyzed descriptively, by frequency, using the Statistical Package for Social Sciences (SPSS), version 25.0 (IBM SPSS Statistics for Windows, Armonk, NY).

Results

The descriptive analysis showed that 98% of OHTs guarantee the scheduling of appointments and the spontaneous meeting of demand. Table 1 shows the organization of the spontaneous demand and the frequency of 26 primary dental care procedures performed by the OHTs, including preventive, restorative/prosthetic, surgical and actions of cancer monitoring. Most of OHTs perform basic procedures, such as supragingival scaling, root planning, and coronal polishing (98.1%); composite fillings (99.0%), and permanent tooth extractions (98.6%). However, it was observed that the frequency decreased when asked about procedures related to dental prostheses. Only 15.1% of the OHTs perform impressions for prostheses and 13.6% conduct prostheses' installations. With regard to actions for cancer prevention, most of the OHTs perform actions to prevent and diagnose oral cancer (94.9%), including medical advice on tobacco use (93.2%) as well as on alcohol and other drugs (91.7%). This percentage decreased slightly when ask about the active search for potentially precancerous lesions and cases in the population (80.5%). In addition, most OHTs did not perform biopsies (12.0%) and did not monitor patients undergoing biopsy to evaluate the results of the examination (30.9%).

Table 2 shows the scores of basic procedures that OHT's performed, which was, on average, 19.45 (±3.16) dental procedures (0–26 procedures). Regarding the average number of procedures performed according to the Brazilian regions, it was observed that the OHTs in the

Table 1. Basic dental procedures performed by oral health teams, Brazil, 2017–2018.

Variables	Yes (%)
Response to spontaneous demand	
Urgency care (drainage of abscess, suture of trauma injuries, access to dental pulp, pulpotomy, treatment of alveolitis, initial treatment of traumatized tooth)	22,298 (97.0)
Prescription of medicines	22,360 (97.2)
Medical advice	22,253 (96.8)
Preventive and periodontal procedures	
Fluoride application	22,651 (98.5)
Ionomer sealant application	20,102 (87.4)
Supragingival scaling, root planning, and coronal polishing	22,566 (98.1)
Subgingival scaling, root planning, and coronal polishing	20,117 (87.5)
Restorative/Prosthetic procedures	
Composite filling	22,767 (99.0)
Amalgam filling	18,450 (80.2)
Ionomer filling	22,310 (97.0)
Impression for prostheses	3,471 (15.1)
Prostheses installation	3,114 (13.6)
Prostheses cementation	5,785 (25.2)
Surgical procedures	
Deciduous tooth extraction	22,812 (99.2)
Permanent tooth extraction	22,680 (98.6)
Ulotomy/ulectomy	18,803 (81.8)
Cancer monitoring	
Does the OHT carry out actions to prevent and diagnose oral cancer?	21,817 (94.9)
Medical advice on tobacco use	21,439 (93.2)
Medical advice on the use of alcohol and other drugs	21,076 (91.7)
Medical advice on the prevention of exposure to solar radiation	19,929 (86.7)
Active search for potentially precancerous lesions and cases in the population	18,498 (80.5)
Systematic examination of oral mucosa	20,468 (89.0)
Does the OHT perform biopsies to diagnose oral cancer?	2,769 (12.0)
Does the OHT have a record of patients with suspected oral cancer who were biopsied or referred to the referral service?	7,831 (34.1)
Does the OHT have a document that proves this?	6,891 (30.0)
Does the OHT monitor patients undergoing biopsy to evaluate the results of the examination?	7,109 (30.9)
After the user's reference for treatment, does the OHT follow up and monitor the continuity of care?	14,645 (63.7)

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Table 2. Scores of dental procedures performed by OHTs in Brazilian geographic regions, Brazil, 2017–2018.

Brazilian Regions	OHT	%	Mean	Minimum	Maximum	Median
North	1,916	7.6	16.91	2	25	18
Northeast	11,132	44.4	19.46	0	26	20
Midwest	2,026	8.1	18.8	2	26	19
Southeast	6,751	26.9	20.16	0	26	20
South	3,265	13.0	19.84	3	26	20

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South, Southeast, and Northeast had a higher number of primary dental procedures, while the teams in the North and Midwest, on average, performed fewer procedures.

Discussion

The descriptive analysis revealed that most OHTs perform basic dental procedures, as recommended by the MofH, including emergency, preventive, restorative and surgical procedures. Regarding dental prostheses, few teams perform impressions, installations, and cementation of dental prostheses at the PHC. Although most teams perform actions to prevent and diagnose oral cancer, few teams perform biopsies of suspected cases, keep adequate records, or monitor patients undergoing biopsy to evaluate the results of the examination. In addition, the results revealed differences between Brazilian regions in relation to the procedures performed by the teams, invalidating the null hypothesis.

Despite changes in data collection methodology in the 3rd cycle, our findings are similar to previous 1st cycle [10,11] and 2nd cycle [13,15,16] studies. The highest perform of basic oral health procedures by OHTs, like emergency, preventive, restorative and surgical procedures, can be explained by the improvement in the infrastructure of dental offices and working conditions, and higher qualification of professionals due to the increase in investments in oral health, provided by the National Oral Health Policy [17]. The work process of oral health care is affected by legislation of the country [18], and access to care is influenced by the social determinants of health [19]. The delivery of health promotion strategies at the population level has shown a great impact on reducing the prevalence of oral diseases [19,20]. Health systems that strength preventive and tooth-preserving strategies, inclusive of adults, progress faster and perform better in respect of effectiveness and efficiency [20]. Over the past several decades, Netherlands passed by changes in the funding of oral health care aiming to reduce the need for curative treatment and more emphasis on prevention of dental diseases. These changes improved oral health, especially, Dutch adults [18]. Although progress has been made in the offer and organization of services, access has been expanded and oral health actions have been qualified, considering that, 17 years after the launch of the National Oral Health Policy, there are still difficulties to implement basic premises, such as completeness and access to secondary care and reduction of regional inequalities [21]. So, more political actions are needed to reduce inequalities, to promote health [19], and to improve the work process of OHTs.

Our results showed that most OHTs provide spontaneous demand care, together with emergency care, prescription of medication, or specialized guidance. Despite the advances in oral health services in recent years [17], the population still has a repressed demand for dental treatment, which leads to the search for emergency care [22]. Considering the current moment of the COVID-19 pandemic, when most routine dental care is not available, an increase in repressed demand is expected, causing more patients to seek out emergency dental care [23]. In this sense, it is expected that OHTs will be able to meet the demand, since they claim to be performing these types of procedures. In this sense, the emergency dental care must be

showing important differences between the regions. This difference can be explained by the level of development of these regions. Despite the growth of the Municipal Human Development Index (HDI), which has proven to be more accelerated in recent years in Brazil, with improvement in the indices of all regions, the North and Northeast still have the lowest HDI in the country. The highest HDI is recorded in the Southeast region (0.766), followed by the Midwest (0.757) and South (0.754) regions [34]. From 2004, with National Oral Health Policy, an increase in the oral health incentive was observed for municipalities with lower HDIs. This policy benefited the North and Northeast regions, with increased access and improved infrastructure. However, the impact of this policy on service use was not enough, since the proportion of procedures is still higher among regions with higher HDIs [28,35].

In recent years, Brazil has expanded oral health service coverage and there have been changes in the epidemiological profile of oral diseases, but efforts are still needed to reduce inequalities in access to services, in improved and qualified care, as well as in the use epidemiology for planning oral health actions [11,19]. The Northeast region has a higher number of OHTs in the country, while the North region presents the worst HDI of the country and the lowest number of OHTs. However, this number does not reflect a higher score of dental procedures performed by OHTs when compared to the Southeast and South regions.

Therefore, the results showed that only the number of OHTs does not necessarily translate into better care for the population. Other factors, such as different socio-demographic conditions, repressed demand for dental treatment, and the organization of the dental service may interfere in the offer of the service to the population.

This study's results are limited due to the use of a secondary database, based on dentist reports, and by the fact that PMAQ-AB is a pay-for-performance program. Nevertheless, the need to improve and expand the supply of prostheses and actions related to the early diagnosis and monitoring of oral cancer is evident. Despite these limitations, our study is based on national data, from the largest PHC evaluation program ever conducted in Brazil in its third cycle [8], which reinforces the relevance of our results.

It is necessary to increase the range of procedures offered by OHTs and reduce regional inequalities, adapting them to the needs of the population in order to achieve comprehensive oral health care. Health assessments can provide an overview that allows one to trace ways to boost access to oral health.

Supporting information

S1 Dataset.
(XLSX)

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References

1. Miclos PV; Calvo MCM, Colussi CF. Avaliação do desempenho da Atenção Básica nos municípios brasileiros com indicador sintético. Saúde debate. 2015; 39(107): 984–996.
2. Pucca GA, Gabriel M, de Araujo ME, de Almeida FC. Ten years of a National Oral Health Policy in Brazil: innovation, boldness, and numerous challenges. J Dent Res. 2015; 94(10):1333–7. https://doi.org/10.1177/0022034515599979 PMID: 26316461
3. Pucca Junior GA, Lucena EH, Cawahisa PT. Financing national policy on oral health in Brazil in the context of the Unified Health System. Braz Oral Res. 2010; 24 (Suppl 1):26–32. https://doi.org/10.1590/s1806-83242010000500005 PMID: 20857072
4. Nascimento AC, Moysés ST, Werneck RI, Moysés SJ. Oral health in the context of primary care in Brazil. Int Dent J. 2013; 63(5):237–43. https://doi.org/10.1111/idj.12039 PMID: 24074017
5. SAGE. Sala de Apoio à Gestão Estratégica. Ministério da Saúde. Available online: http://sage.saude.gov.br/# (accessed on 19 June 2020).
6. Sousa AN. Monitoramento e avaliação na atenção básica no Brasil: a experiência recente e desafios para a sua consolidação. Saúde debate. 2018. 42(spe1): 289–301.
7. Miclos PV, Calvo MCM, Colussi CF. Evaluation of the performance of actions and outcomes in primary health care. Rev Saude Publica. 2017; 51:86. https://doi.org/10.11606/S1518-8787.2017051006831 PMID: 28954165
8. Pelissari DM, Bartholomay P, Jacobs MG, Arakaki-Sanchez D, Anjos DSOD, Costa MLDS, et al. Offer of primary care services and detection of tuberculosis incidence in Brazil. Rev Saude Publica. 2018; 52:53. https://doi.org/10.11606/s1518-8787.2018052000131 PMID: 29791528
9. Ministério da Saúde. Programa Nacional de Melhoria do Acesso e da Qualidade da Atenção Básica (PMAQ-AB): Manual Instrutivo do 2˚Ciclo; Ministério da Saúde: Brasília, Brasil, 2015. (In Portuguese).
10. Reis CM, Matta-Machado AT, Amaral JH, Werneck MA, Abreu MH. Describing the primary care actions of oral health teams in Brazil. Int J Environ Res Public Health. 2015; 12(1):667–78. https://doi.org/10.3390/ijerph120100667 PMID: 25588158
11. Neves M, Giordani JM, Ferla AA, Hugo FN. Primary care dentistry in Brazil: From prevention to comprehensive care. J Ambul Care Manage. 2017; 40 Suppl 2, The Brazilian National Program for Improving Primary Care Access and Quality (PMAQ): S35-S48. https://doi.org/10.1097/JAC.0000000000000186 PMID: 28252501
12. Ministério da Saúde. Programa Nacional de Melhoria do Acesso e da Qualidade da Atenção Básica (PMAQ-AB): Manual Instrutivo do 3˚Ciclo; Ministério da Saúde: Brasília, Brasil, 2013. (In Portuguese).
13. Mendes SR, Martins RC, Matta-Machado ATGM, Mattos GCM, Gallagher JE, Abreu MHNG. Dental procedures in Primary Health Care of the Brazilian National Health System. Int J Environ Res Public Health. 2017; 14(12). https://doi.org/10.3390/ijerph14121480 PMID: 29194346
14. Paim J, Travassos C, Almeida C, Bahia L, Macinko J. The Brazilian health system: history, advances, and challenges. Lancet 2011; 377(9779):1778–97. https://doi.org/10.1016/S0140-6736(11)60054-8 PMID: 21561655
15. Cunha MAGM Matta-Machado ATG, Lucas SD Abreu MHNG. Availability of dental prosthesis procedures in Brazilian Primary Health Care. Biomed Res Int. 2018; 2018:4536707. https://doi.org/10.1155/2018/4536707 PMID: 29607319

16. Abreu MHNG, Morato ALFN, Marinho AMCL, Cunha MAM, Mendes SR. What Has Changed in the dental prosthesis procedures in Primary Health Care In Brazil? Braz. Dent. J. 2019; 30(5):519–522. https://doi.org/10.1590/0103-6440201902695 PMID: 31596337

17. Chaves SCL, Almeida AMFL, Rossi TRA, Santana SF, Barros SG, Santos CML. Oral health policy in Brazil between 2003 and 2014: scenarios, proposals, actions, and outcomes. Cien Saude Colet. 2017; 22(6):1791–803. https://doi.org/10.1590/1413-81232017226.18782015 PMID: 28614500

18. den Boer JCL, van der Sanden WJM, Bruers JJM. Developments in oral health care in the Netherlands between 1995 and 2018. BMC Oral Health. 2020; 20(192); https://doi.org/10.1186/s12903-020-01174-8 PMID: 32641034

19. Abreu MHNG, Cruz AJC, Borges-Oliveira AC, Martins RC, Mattos FF. Perspectives on social and environmental determinants of oral health. Int J Environ Res Public Health. 2021; 18(24):13429. https://doi.org/10.3390/ijerph182413429 PMID: 34949037

20. Saekel R. Evaluation of different oral care systems: results for Germany and selected highly developed countries. an update of a former study. Dent Oral Craniofac Res. 2018; 4(4): 1–8.

21. Aquilante AG, Aciole GG. Oral health care after the National Policy on Oral Health—"Smiling Brazil": a case study. Cien Saude Colet. 2015; 20(1):239–48. https://doi.org/10.1590/1413-81232014201.21192013 PMID: 25650618

22. Pinto EC, Barros VJ de A., Coelho MQ, Costa SM. Urgências odontológicas em uma Unidade de Saúde vinculada à Estratégia Saúde da Família de Montes Claros, Minas Gerais. Arq. Odontol. 2012; 48(3): 166–174.

23. Guo H, Zhou Y, Liu X, Tan J. The impact of the COVID-19 epidemic on the utilization of emergency dental services [published online ahead of print, 2020 Mar 16]. J Dent Sci. 2020; https://doi.org/10.1016/j.jds.2020.02.002 PMID: 32296495

24. Meng L, Hua F, Bian Z. Coronavirus Disease 2019 (COVID-19): Emerging and Future Challenges for Dental and Oral Medicine. J Dent Res. 2020; 99(5):481–487. https://doi.org/10.1177/0022034520914246 PMID: 32162995

25. Matthews DC. Prevention and treatment of periodontal diseases in primary care. Evid Based Dent. 2014; 15(3):68–9. https://doi.org/10.1038/sj.ebd.6401036 PMID: 25343386

26. Peres MA., Barbato PR, Reis SCGB, Freitas CHS, Antunes JLF. Perdas dentárias no Brasil: Análise da Pesquisa Nacional de Saúde Bucal 2010. Rev. Saúde Pública. 2013; 47(Suppl 3):78–89.

27. Cunha AM, Vettore MV, Santos TR, Mata-Machado AT, Lucas SD, Abreu MHNG. The role of the organizational factors and human resources in the provision of dental prothesis in primary dental care in Brazil. Int J Environ Res Public Health. 2020; 17(5):1646.

28. Galante ML, Silva DP, Gabriel M, Michel-Crosato E, Pucca Junior GA, Biazevic MGH, et al. Brazilian oral health teams in primary care and oral cancer: results of a national evaluation. Braz Oral Res. 2021; 35:e116. https://doi.org/10.1590/1807-3107bor-2021.vol35.0116 PMID: 34816904

29. Cunha ARD, Prass TS, Hugo FN. Mortality from oral and oropharyngeal cancer in Brazil: impact of the National Oral Health Policy. Cad Saude Publica. 2019; 35(12):e00014319. https://doi.org/10.1590/0102-311X00014319 PMID: 31800779

30. Van der Waal I. Are we able to reduce the mortality and morbidity of oral cancer; some considerations. Med Oral Patol Oral Cir Bucal. 2013; 18(1):e33–7. https://doi.org/10.4317/medoral.18486 PMID: 23229266

31. Shield KD, Ferlay J, Jemal A, Sankaranarayanan R., Chaturvedi A. K., Bray F., et al. The global incidence of lip, oral cavity, and pharyngeal cancers by subsite in 2012. CA Cancer J Clin. 2017; 67(1):51–64. https://doi.org/10.3322/caac.21384 PMID: 28076666

32. Reis CMR, Matta-Machado ATG, Amaral JHL, Mambrini JVM, Werneck MAF, de Abreu MHNG. Understanding oral health care team performance in primary care: A mixed-method study. Plos One. 2019; 14(5):e0217738. https://doi.org/10.1371/journal.pone.0217738 PMID: 31145771

33. Chakraborty D, Natarajan C, Mukherjee A. Advances in oral cancer detection. Adv Clin Chem. 2019; 91:181–200. https://doi.org/10.1016/bs.acc.2019.03.006 PMID: 31331489

34. Radar IDHM: evolução do IDHM e de seus índices componentes no período de 2012 a 2017.–Brasília: IPEA: PNUD: FJP, 2019.

35. Chaves SCL, Almeida AMFL, Reis CS, Rossi TRA, Barros SG. Oral Health Policy in Brazil: transformations in the period 2015–2017. Saúde debate, 2018; 42(2):76–91.

4.2 Artigo 02

Performance evaluation of Oral Health Teams in Brazil: An Item Response Theory approach

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Title: Performance evaluation of Oral Health Teams in Brazil: An Item Response Theory approach

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Performance evaluation of Oral Health Teams in Brazil: An Item Response Theory approach

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Abstract

Objectives: To describe the actions performed by Brazilian Oral Health Teams (OHTs) and the relationship of contextual aspects.

Research Design: 22,993 OTHs analyzed in the 3rd cycle of the National Program for Improving Access and Quality of Primary Care were evaluated using a structured questionnaire. Thirteen procedures (items) related to spontaneous dental care, as well as preventive, surgical, restorative, prosthetic, and oral cancer prevention or diagnosis were assessed. Item Response Theory (IRT) was used to estimate the performance scores of OHTs, based on 13 items. The relationship between performance scores and contextual variables (Human Development Index -HDI, and Gini Index) in Brazilian regions, was analyzed by thematic maps and Pearson correlation ($p<0.05$).

Results: Cronbach's alpha coefficient was 0.53, and the score related to the first component explained 45.32% of the items. The highest difficulty parameters were for questions related to prosthetics (b=1.157) and actions for oral cancer (b=2.544). The OHT performance score ranged from -3.65 (low performance) to +1.33 (high performance). The information curve of the test revealed that the 13 items were more appropriate to discriminate the teams with lower performance, and relatively ineffective in differentiating those with better performance.

Thematic maps showed a direct relationship with HDI ($p < 0.0001$) and an indirect relationship with the Gini index ($p= 0.0001$).

Conclusion: Contextual aspects presented a relationship with the performance of the Brazilian OHTs. The evaluated items showed some potential to discriminate the performance of OHTs, since many of the evaluated dental procedures are performed by most of teams.

Key words: Primary Health Care; Oral Health; Dental Health Services; Healthcare Quality, Access, and Evaluation

Introduction

Brazil's Unified Health System (SUS, in Portuguese) is the largest public health system in the world serving more than 190 million people, with 80% of the population relying exclusively on public services for any health care [1]. SUS is based on primary healthcare (PHC) principles of health promotion, prevention, and comprehensive health care [2]. In oral health, the expansion of care occurred with the inclusion of Oral Health Teams (OHTs) within primary care teams. The creation of the National Oral Health Policy (PNSB, in Portuguese), has improved dental care of the population, with offers of prostheses in PHC and secondary care in specialty centers [3].

OHTs in Brazil offer surgical-restorative, preventive, and emergency clinical procedures, as well as actions to prevent oral cancer and rehabilitation through dental prostheses [4,5]. After more than eighteen years of PNSB, there are still challenges for the consolidation of integrality and universalization of actions and services offered to the population [6]. In this regard, the evaluation of primary care services can help identify and guide the solution of problems related to healthcare work processes [7].

To expand access to both primary care and the quality of services offered to general population, in 2011, the Brazilian Ministry of Health (MofH) instituted the National Program for Improving Access and Quality of Primary Health Care (PMAQ-AB, in Portuguese). This is the largest health service evaluation program in the country. The program ended in 2018 after three evaluation cycles, with the 1st cycle taking place from 2011 to 2012, with 12,403 OHTs participating; the 2nd cycle between 2013 and 2014, with 19,946 OHTs participating, and the third cycle between 2017 and 2018, involving 25,090 OHTs. The design of the 3rd cycle comprises three stages of adhesion and agreement, certification, and re-agreement, along with one strategic transverse axis of development [8]. Results evaluating the performance of

Brazilian OHTs in the 1st cycle of PMAQ-AB showed that teams with high performance develop more actions to identify oral cancer and provide more dental prostheses in PHC [9]. Results of the 2nd cycle also showed that the actions related to oral cancer screening and the construction of dental prostheses were related to a higher level of difficulty, and were conducted by OHTs with higher performance scores [10].

Brazil has an extensive territory and is marked by socioeconomic inequalities, which have an impact on health services and, consequently, on the population's health [2]. Brazil has upgraded its health service coverage over the last three decades since the creation of SUS. However, despite these advances, it is still necessary to address lingering geographic inequalities within Brazil [11].

Therefore, this study aims to describe the actions performed by OHTs within PHC in Brazil and the relationship of contextual aspects that lead to different levels of OHT performance in the 3rd cycle of evaluation of PMAQ-AB. The null hypothesis of this study was that there is no impact of contextual factors upon the performance of Brazilian OHTs.

Methods

This study was approved by the Research Ethics Committee of Universidade Federal de Minas Gerais, logged under protocol number 02396512.8.0000.5149.

This study used secondary data from the 3rd cycle of PMAQ-AB, which occurred between 2015 and 2018, where 25,090 OHTs were assessed. Of these, 2,097 (8.4%) were disqualified by PMAQ-AB evaluation criteria, as they did not follow the program's recommendations, such as an adequate oral health surveillance system and the presence of the dentist and dental equipment in the PHC unit. The final sample included 22,993 OHTs.

The data were collected during the external evaluation phase, which is characterized by a visit of evaluators to the PHC units and verification of documents to attest the quality standards established in accordance with norms, protocols, principles and guidelines for the organization of actions and practices considered essential and established by MofH.

An instrument developed by MofH, in partnership with Brazilian teaching and research institutions, was applied by previously calibrated teams. This instrument included issues related to the structure of dental facilities, working processes, management, and service organization. The answers were recorded on tablets. After data collection, the partner institutions performed the data validation and sent the results to the MofH's central database.

This study used a total of 21 questions, mostly dichotomous (yes/no), on primary dental healthcare procedures performed by OHTs. These questions included items about emergency care (response to spontaneous demand); surgical-restorative clinical procedures (deciduous tooth extraction, permanent tooth extraction, ulotomy/ulectomy, amalgam filling, composite filling, ionomer filling); preventive procedures (ionomer sealant application, fluoride application, supragingival and subgingival scaling, root planning, and coronal polishing); actions related to the manufacture of dental prostheses (impression, installation, and prostheses cementation); and actions related to the prevention or diagnosis of oral cancer (prevention and diagnosis of oral cancer, medical advice on tobacco use, medical advice on alcohol use and other drugs, medical advice on the prevention of exposure to solar radiation, active search for potentially precancerous lesions and cases in the community, systematic examination of oral mucosa, biopsies performed to diagnose oral cancer). The three questions about the manufacture of dental prostheses were compiled into one variable. The same was done for the seven questions about the prevention or diagnosis of oral cancer. Thirteen items with self-reported spontaneous dental care; preventive, surgical, restorative, and prosthetic-related procedures; and oral cancer prevention and diagnosis were then assessed.

For each procedure (item), such as spontaneous dental care, surgical-restorative clinical procedures, preventive procedures, and actions related to the manufacture of dental prostheses, the performance of OHTs were dichotomized for those OHTs that performed no procedures and other OHTs that performed some type of the procedure. For actions related to cancer prevention and diagnosis, three categories involved the OHTs that do not perform any action; OHTs that perform some of the seven actions; and OHTs that perform all of the seven actions.

The Item Response Theory (IRT) model for graded responses [12] was used to estimate the performance scores of OHTs, based on 13 items. The IRT involves a set of mathematical models that relate an individual's probability of response to an article and its latent characteristic, which is a characteristic that cannot be measured directly, such as attitude, satisfaction, and proficiency [13]. The latent construct for this study was the performance of the OHTs, estimated through the answers obtained on the execution or not of 13 selected items of dental procedures.

Descriptive analyses of dental procedures were performed. To confirm the feasibility of IRT application, the first value was calculated from the decomposition of the polychoric correlation matrix, checking its domain. The internal consistency of the scale was also evaluated using Cronbach's alpha.

The IRT model enables a deeper analysis of the variables used to construct the measure, including the level of difficulty and capacity for discrimination [14]. It is not the number of dental procedures performed by the OHTs that determine its performance, but rather the weighing of the level of difficulty and the capacity to discriminate between items. The discrimination parameter consists of the item's ability to distinguish between teams with different abilities. The higher the value of the discrimination parameter, the more the item is

able to detect differences between teams. The difficulty parameter is the minimum skill a team needs to have a probability of 0.5 (50%) to perform the procedure.

The discrimination parameter and difficulty level of each evaluated procedure were calculated by IRT and, based on the results, each OHT received a score. The scores assigned to each team theoretically may vary from -4 to +4. The OHTs were classified according to their performance based on quartile cut-off points. In addition, the test information curve was obtained to identify the scoring range in which the present instrument provides information.

The data were organized in Stata Software (StataCorp. 2015. Stata Statistical Software: Version 14. University Station, TX: StataCorp LP). The ltem package for Latent Variable Modeling and Item Response Analysis [15] of R software v. 4.0.2 [16] was used to analyze the data. Descriptive analysis and correlation matrix to check the IRT hypothesis, and the latent trace model [15] was used to adjust the IRT model.

Brazil has 133 Intermediate Geographic Regions, 510 Immediate Geographic Regions, and 5,570 municipalities, divided into five geographic regions: North, Northeast, Southeast, South, and Midwest. The Intermediate Geographic Regions correspond to an intermediate scale between the regions and the Immediate Geographic Regions. The Intermediate Geographic Regions organize the territory, articulating the Immediate Geographic Regions by means of a differentiated higher hierarchy pole, public management flows, and the existence of more complex urban functions [16]. The relationship between performance scores and the median of contextual variables of Human Development Index (HDI) and the Gini Index [17], in the Intermediate Geographic Regions [16] of Brazil, was analyzed by thematic maps and the Pearson correlation ($p<0.05$), using R software for analysis.

Results

The Cronbach alpha coefficient was 0.53, and the score related to the first component explained 45.32% of the analyzed items, which maintained the IRT unidimensionality hypothesis.

Table 1 shows the discrimination parameter and difficulty level of each evaluated procedure performed by OHTs. Difficulty parameters with negative values reveal which items were frequently performed by the OHTs, while positive values reveal items that are less frequently performed by the teams. The items with higher difficulty parameters were those related to prostheses (b=1.157) and oral cancer monitoring actions (b=2.544).

The performance score resulting from the IRT model adjustment showed an asymmetric distribution, with a mean of -0.067 (SD± 0.711) and a median of 0.15. The highest score identified for a team was +1,330, which was classified as high performing, and the lowest score obtained was -3,652, which was classified as low performing. The information curve of the test revealed that the 13 items are more appropriate to discriminate the teams with lower performance, and are relatively ineffective in differentiating those with a better performance.

Figure 1 shows the characteristic curves of the items analyzed related to spontaneous dental care, along with preventive and surgical procedures performed by OHTs. Curves exhibit similarities for spontaneous dental care, fluoride application, ionomer sealant, supra and subgingival root planning, coronal polishing, and surgical procedures. This indicates that OHTs with negative values present a high probability to perform these procedures frequently.

Figure 2 shows the characteristic curves of the analyzed items related to restorative and prosthesis procedures, as well as the cancer monitoring performed by OHTs. The curves show similarities for the composite, amalgam, and ionomer fillings, with a difficulty parameter of close to -2, revealing that most OHTs present a high probability to perform these procedures.

By contrast, only OHTs with a value close to the maximum score (+2) present a high probability to perform any type of prosthesis procedures analyzed in this study. For oral cancer, OHTs with a higher probability to perform all actions of cancer prevention and diagnosis are those with a value close to the maximum score (+2).

The thematic maps showed a direct relationship of the estimated IRT scores with the HDI median and indirect relationship with the Gini Index, confirmed by Pearson's correlation coefficient (r= 0.2788; p-values < 0.0001 and r= -0.5764; 0.0001, respectively). The map analysis shows that OHTs with the worst scores (<- 0.37) are mostly located in the intermediate regions, corresponding to the North region of the country (Figure 3a). Figure 3b and 3c, respectively, show the distribution of HDI and Gini index medians, according the division into intermediate regions [16]. It can be observed that intermediate regions of Brazil with a lower HDI, the majority of which corresponds to the North and Northeast regions, present OHTs with lower scores. Intermediate regions with a higher Gini Index and, therefore, a greater inequality, corresponds mainly to North and Northeast regions, and presents OHTs with lower scores.

Discussion

Many of the dental procedures, such as spontaneous dental care, as well as preventive, restorative, and surgical procedures, presented a high probability of being performed by most of the OHTs. All procedures of cancer prevention and diagnosis, as well as those related to prostheses, presented a probability of being less commonly performed by the teams. The analyzed items were more appropriate in discriminating between the OHTs with a lower performance, which are relatively ineffective in differentiating between those with a better performance, since many of the evaluated dental procedures are performed by most of the OHTs. A relationship of the estimated scores with contextual factors was observed, invalidating the null hypothesis.

OHTs frequently conduct the basic procedures regardless of their performance score. These findings are similar to those obtained in two previous cycles of PMAQ-AB [3,4]. The performance of clinical procedures is directly influenced by the infrastructure conditions, availability, and adequacy of equipment and materials. In this sense, the OHTs are more likely to perform basic dental procedures because of the improvements in the structure of services and the expansion of access over the last eighteen years as a result of the PNSB [10,18]. Most Brazilian OHTs are well structured in relation to the availability of equipment, instruments, and supplies for dental practice, which may contribute to the understanding of the high frequency of performance of basic procedures by the teams [19]. The high frequency of procedures related to response to spontaneous demand can be explained by the fact that the Brazilian health system still presents accumulated needs in oral health, which leads to the aggravation of oral diseases with consequent painful symptomatology [20]. By contrast, the frequent performance of curative and surgical procedures reveals that dental practices in PHC is still centered on the traditional healthcare model, based on direct restorations and extractions. The universal health coverage in an unequal country like Brazil is still a challenge [10]. Although these are important procedures, it is important to provide comprehensive dental care with more complex procedures [21].

The procedures related to prostheses were less likely to be performed by OHTs. The last national epidemiological survey [22] revealed a high prevalence of edentulism in the adult and elderly Brazilian population. The distribution of regional prosthetic laboratories in the country has not followed the epidemiological needs of the population, and the growth in the production of prostheses has been discrete [23]. The results of the present study show that there are OHTs that create prosthesis impressions but do not install them and that do prosthesis impressions but do not cement them, which could result in an unfinished service. This is worrisome since, in Brazil, much of the need for prosthetic rehabilitation falls on the public health system [24]. A

greater evaluation of dental protheses procedures should be carries out in Brazilian PHC services.

Regarding oral cancer actions, it is worrisome that OHTs are less likely to perform all actions for the prevention or diagnosis of the disease. The majority of OHTs perform some of the seven analyzed actions. This can lead to many cases without diagnosis or with a late diagnosis of the disease. This is very serious, since this type of cancer corresponds to about 2% of all cancer cases diagnosed worldwide [25], and its early diagnosis is important and decisive in determining an efficient treatment that can lead to a cure or increased survival of patients [26]. It is important to ensure that PHC dentists be trained for early identification and referral for specialist care of patients with potentially malignant lesions, which can increase treatment success [9]. Moreover, it is important to structure and/or reinforce financing and development policies for the teams, providing equal conditions throughout the country to expand the performance of procedures, especially those related to prosthetics and oral cancer monitoring.

The lower HDI and higher Gini index median results in worse OHT scores, showing that these values are spatially distributed in a related way in the intermediate geographic regions, confirming the existence of socioeconomic differences in Brazil. The OHTs with the worst scores were located in the intermediate regions of Brazil, corresponding mainly to the North and Northeast regions. The expansion of SUS over the last three decades has allowed Brazil to improve the healthcare needs of its population, with the upgrading of healthcare service coverage. However, despite its successes, it is necessary to address lingering geographic inequalities [10]. The North and Northeast regions present the greatest social and economic challenges among the Brazilian regions [1]. These differences may result in a better assistance of dental care services in the South and Southeast regions, which present better indices when compared to the rest of the country [1,27]. The comparison between different Brazilian geographic regions related to the performance of primary dental care revealed that OHTs in the

South and Southeast regions are better than the others, especially when compared to those in the North region, reinforcing the great social disparities [3,4]. Health inequalities in Brazil can be explained, in part, by differences in access and infrastructure of services and in the determinants of health among these regions, which reflect the quality of care provided.

It is necessary to structure and improve public policies aimed at promoting comprehensive care in order to expand and qualify the work process of oral health services in PHC [28]. However, it is important for expansion to promote a better regional distribution of OHTs in order to reduce inequities. Moreover, the insertion of missing procedures in PHC, which responds to the epidemiological needs of the population [29], can result in the improvement of the population's oral health [3].

This study used a secondary database of the 3rd evaluation cycle of the PMAQ-AB. The participating OHTs were selected by the municipal manager, and these procedures, in turn, may have chosen those with the best structures and organization, which can be considered a limitation of the study, because weaker teams may not have participated in the study. Moreover, the PMAQ-AB is a pay-for-performance program that may motivate the OHTs to provide positive answers to the questionnaire items [3].

IRT analyses revealed that items were more appropriate in discriminating between the lower performance teams, and are relatively ineffective in differentiating between those with a better performance, since many of the evaluated dental procedures are performed by most OHTs. Contextual aspects presented relationships with the performance of the Brazilian OHTs, reinforcing the great social disparities in the country. The difference found in the care provided requires an improvement in financing policies, evaluation, and development of the teams in order to improve the provision of comprehensive healthcare services to the general population.

References

1. Duarte, E., Eble, L. J., & Garcia, L. P. 30 anos do Sistema Único de Saúde. Epidemiologia e Serviços de Saúde 2018, 27, e00100018..
2. Paim J, Travassos C, Almeida C, Bahia L, Macinko J. The Brazilian health system: history, advances, and challenges. Lancet 2011;377:1778-97.
3. Pucca GA, Costa JF, Chagas LeD, Sivestre RM. Oral health policies in Brazil. Braz Oral Res 2009;23:9-16.
4. Reis CM, Matta-Machado AT, Amaral JH, Werneck MA, Abreu MH. Describing the primary care actions of oral health teams in Brazil. Int J Environ Res Public Health 2015;12:667-78.
5. Mendes SR, Martins RC, Matta-Machado ATGM, Mattos GCM, Gallagher JE, Abreu MHNG. Dental procedures in Primary Health Care of the Brazilian National Health System. Int J Environ Res Public Health 2017;14:1480.
6. Chaves SC. Oral health in Brazil: the challenges for dental health care models. Braz Oral Res 2012;26:71-80.
7. Neves M, Giordani JMDA, Hugo FN. Primary dental healthcare in Brazil: the work process of oral health teams. Cien Saude Colet 2019;24:1809-20.
8. Brasil. Ministério da Saúde. Secretaria de Atenção à Saúde. Departamento de Atenção Básica. Programa Nacional de Melhoria do Acesso e da Qualidade da Atenção Básica (PMAQ-AB): manual instrutivo. Brasília: Ministério da Saúde, 2015.
9. Reis CMR, Matta-Machado ATG, Amaral JHL, Mambrini JVM, Werneck MAF, de Abreu MHNG. Understanding oral health care team performance in primary care: A mixed-method study. PLoS One 2019;14:e0217738.
10. Mendes SR, Martins RC, Mambrini JVM, Matta-Machado ATG, Mattos GCM, Gallagher JE, et al. Using Item Response Theory to evaluate the psychometric

characteristics of questions in a Brazilian programme and the performance of dental teams in primary care. PLoS One 2019;14:e0217249.

11. Castro MC et al. Brazil's unified health system: the first 30 years and prospects for the future. The Lancet 2019; 394:345-56.
12. Samejima, FA. Estimation of latent ability using a response pattern of gradedscores. Psychometric Monograph. 1968; 1:169. Available in: https://onlinelibrary.wiley.com/doi/10.1002/j.2333-8504.1968.tb00153.x
13. Bhakta B, Tennant A, Horton M, Lawton G, Andrich D. Using item response theory to explore the psychometric properties of extended matching questions examination in undergraduate medical education. BMC Med Educ 2005;5:9.
14. Bourion-Bédès S, Schwan R, Epstein J, Laprevote V, Bédès A, Bonnet JL, et al. Combination of Classical Test Theory (CTT) and Item Response Theory (IRT) analysis to study the psychometric properties of the French version of the Quality of Life Enjoyment and Satisfaction Questionnaire-Short Form (Q-LES-Q-SF). Qual Life Res 2015;24:287-93.
15. Dimitris R. ltm: an R package for Latent Variable Modeling and Item Response Analysis. Journal of Statistical Software. 2007; 17:1-25. Available in: https://www.jstatsoft.org/article/view/v017i05
16. R Core Team (2019). R: A language and environment for statistical computing. R Foundation for Statistical Computing, Vienna, Austria. Available in: https://www.R-project.org/
17. Instituto Brasileiro de Geografia e Estatística. Divisão Regional do Brasil em Regiões Geográficas Imediatas e Regiões Geográficas Intermediárias [homepage]. Rio de Janeiro: Instituto Brasileiro de Geografia e Estatística; 2017 [cited 2018 may 4]. Available in: https://www.ibge.gov.br/apps/regioes_geograficas/. Acessed: 13/08/2021.

18. Instituto Brasileiro de Geografia e Estatística (IBGE). Censo Brasileiro de 2010. Rio de Janeiro: IBGE, 2012.
19. Baumgarten A, Hugo FN, Bulgarelli AF, Hilgert JB. Curative procedures of oral health and structural characteristics of primary dental care. Rev Saude Publica 2018;52:35.
20. Scalzo MTA, Matta-Machado ATG, Abreu MHNG, Martins RC. Structural characteristics of oral health services in Brazilian Primary Health Care. Braz Oral Res 2021;35:e023.
21. Frichembruder K, Santos CM, Hugo FN. Dental emergency: scoping review. Plos One 2020;14, e0222248.
22. Neves M, Giordani JM, Ferla AA, Hugo FN. Primary Care Dentistry in Brazil: from prevention to comprehensive care. J Ambul Care Manage 2017;40 2): S35-S48.
23. Brasil. Ministério da Saúde. Secretaria de Vigilância em Saúde. SB Brasil 2010: Pesquisa Nacional de Saúde Bucal: resultados principais. Brasília, DF. 2012.
24. Cunha MAGM, Matta-Machado ATG, Lucas SD, Abreu MHNG. Availability of dental prosthesis procedures in brazilian primary health care. Biomed Res Int 2018;11:4536707.
25. Aguiar VR, Celeste RK. The need for, and allocation of, regional prosthodontics laboratories in Brazil: an exploratory study. Cien Saude Colet 2015;20:3121-8.
26. van der Waal I. Are we able to reduce the mortality and morbidity of oral cancer: some considerations. Med Oral Patol Oral Cir Bucal 2013;18(1):e33-7.
27. Chakraborty D, Natarajan C, Mukherjee A. Advances in oral cancer detection. Adv Clin Chem 2019;91:181-200.
28. Stopa S R, Malta DC, Monteiro CN, Szwarcwald CL, Goldbaum M, Cesar CL G. Use of and access to health services in Brazil, 2013 National Health Survey. Rev Saude Publica 2017:51:3s.

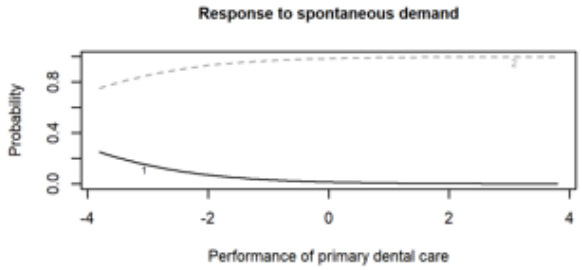
29. Lucena EHGD, Lucena CDRXD, Alemán JADS, Pucca GA, Pereira AC, Cavalcanti YW. (2020). Monitoring of oral health teams after National Primary Care Policy 2017. Rev Saude Publica 2020:54:99.
30. Chaves SCL, Almeida AMFL, Rossi TRA, Santana SF, Barros SG, Santos CML. Oral health policy in Brazil between 2003 and 2014: scenarios, proposals, actions, and outcomes. Cien Saude Colet. 2017;22:1791-803.

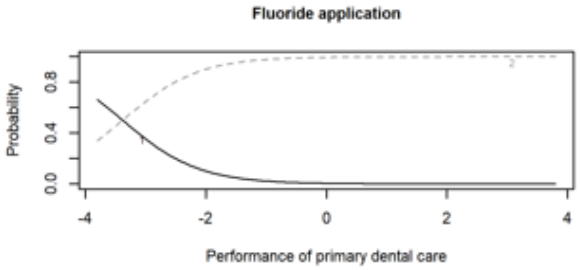
Figure legends:

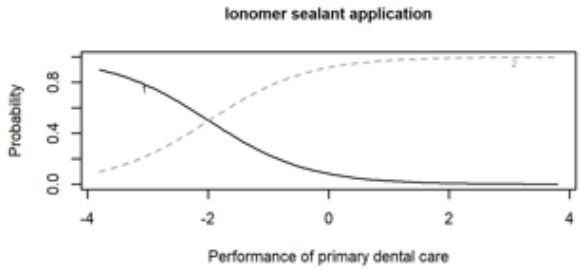
Figure 1 - Item curve characteristics - Probability of an OHT to perform actions related to preventive care and surgical procedures in Brazil (2015-2018). Curve 1 (black) represents the probability of an OHT not to perform the procedure; curve 2 (dotted) represents the probability of an OHT to perform the procedure.

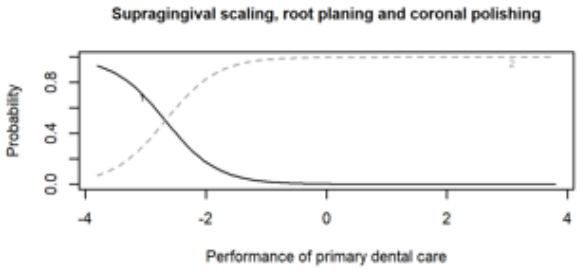
Figure 2 - Item curve characteristics - Probability of an OHT to perform actions related to restorative and prothesis procedures, along with oral cancer actions in Brazil (2015-2018). Curve 1 (black) represents the probability of an OHT not to perform the procedure; curve 2 (dotted) represents the probability of an OHT to perform the procedure. For oral cancer, curve 1 (black) represents the probability of an OHT not to perform any action related to cancer prevention and diagnosis; curve 2 (dotted) represents the probability of an OHT to perform any action related to cancer prevention and diagnosis; and curve 3 (light dotted) represents the probability of an OHT to perform all actions of cancer prevention and diagnosis.

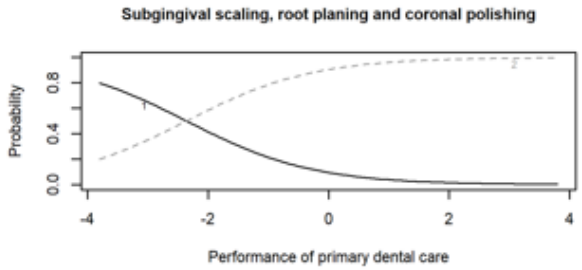
Figure 3 - (a) Regional distribution of the scores of the OHTs evaluated in Brazil, (b) Regional distribution of HDI, and (c) GINI indexes for municipalities with evaluated oral health teams in Brazil (2015-2018).

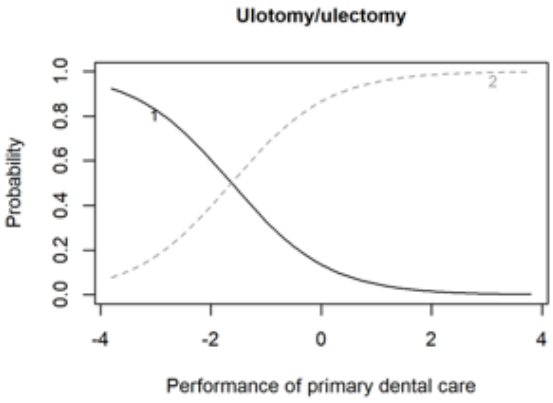

Response to spontaneous demand
Probability
0.0
0.4
0.8
-4
-2
0
2
4
Performance of primary dental care

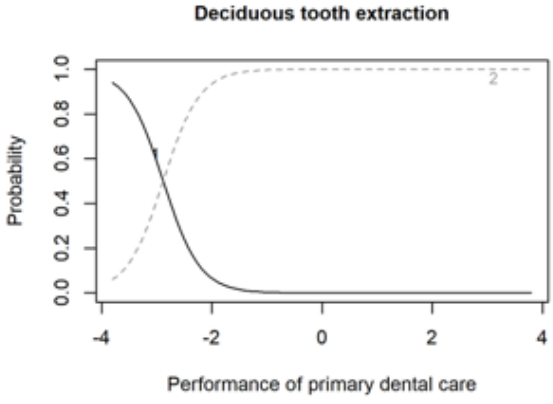

Fluoride application
Probability
0.0
0.4
0.8
-4
-2
0
2
4
Performance of primary dental care

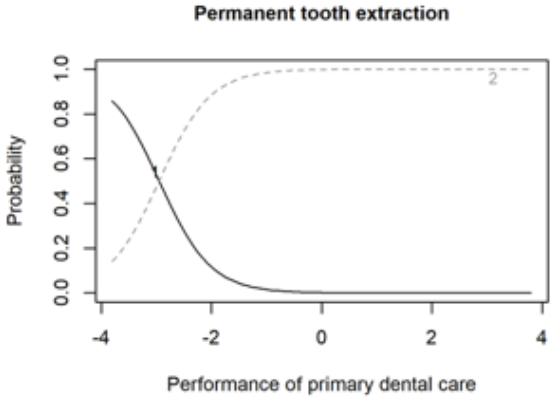

Ionomer sealant application
Probability
0.0
0.4
0.8
-4
-2
0
2
4
Performance of primary dental care

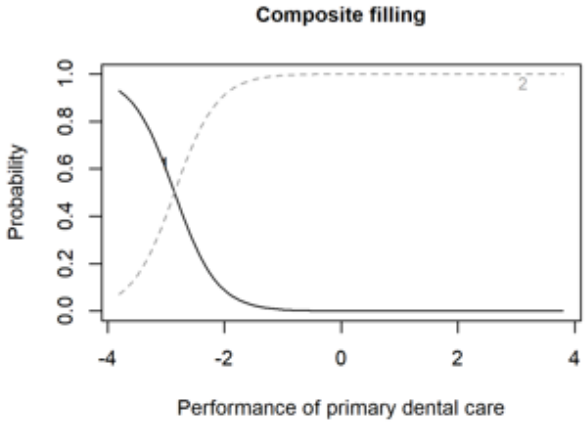

Supragingival scaling, root planing and coronal polishing
Probability
0.0
0.4
0.8
-4
-2
0
2
4
Performance of primary dental care

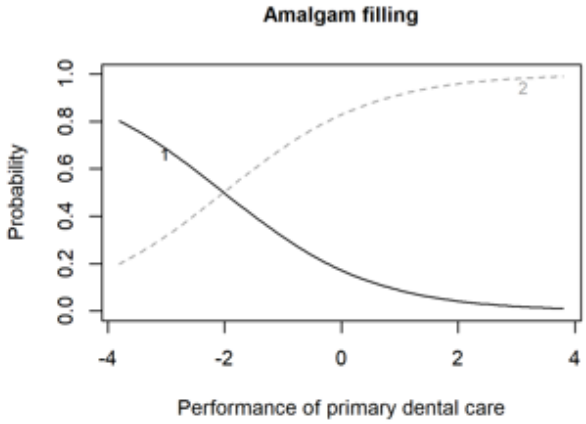

Subgingival scaling, root planing and coronal polishing
Probability
0.0
0.4
0.8
-4
-2
0
2
4
Performance of primary dental care

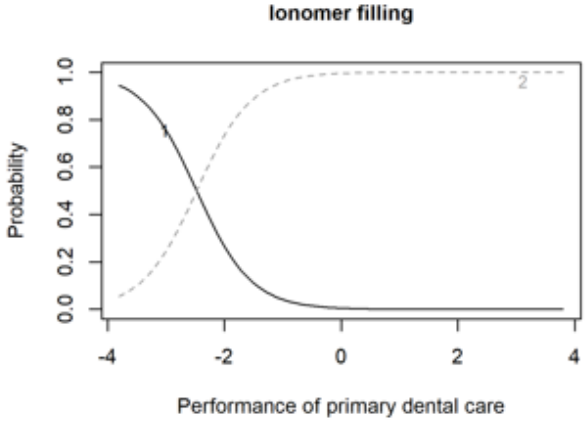

Ulotomy/ulectomy
Probability
0.0
0.2
0.4
0.6
0.8
1.0
-4
-2
0
2
4
Performance of primary dental care

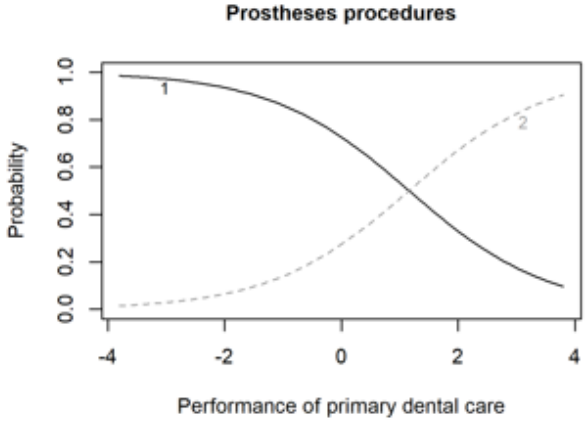

Deciduous tooth extraction
Probability
0.0
0.2
0.4
0.6
0.8
1.0
-4
-2
0
2
4
Performance of primary dental care

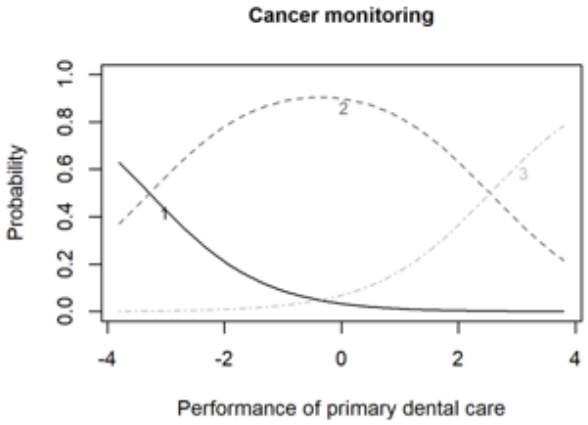

Permanent tooth extraction
Probability
0.0
0.2
0.4
0.6
0.8
1.0
-4
-2
0
2
4
Performance of primary dental care


Composite filling
Probability
0.0 0.2 0.4 0.6 0.8 1.0
1
2
-4 -2 0 2 4
Performance of primary dental care


Amalgam filling
Probability
0.0 0.2 0.4 0.6 0.8 1.0
1
2
-4 -2 0 2 4
Performance of primary dental care


Ionomer filling
Probability
0.0 0.2 0.4 0.6 0.8 1.0
1
2
-4 -2 0 2 4
Performance of primary dental care


Prostheses procedures
Probability
0.0 0.2 0.4 0.6 0.8 1.0
1
2
-4 -2 0 2 4
Performance of primary dental care


Cancer monitoring
Probability
0.0 0.2 0.4 0.6 0.8 1.0
1
2
3
-4 -2 0 2 4
Performance of primary dental care

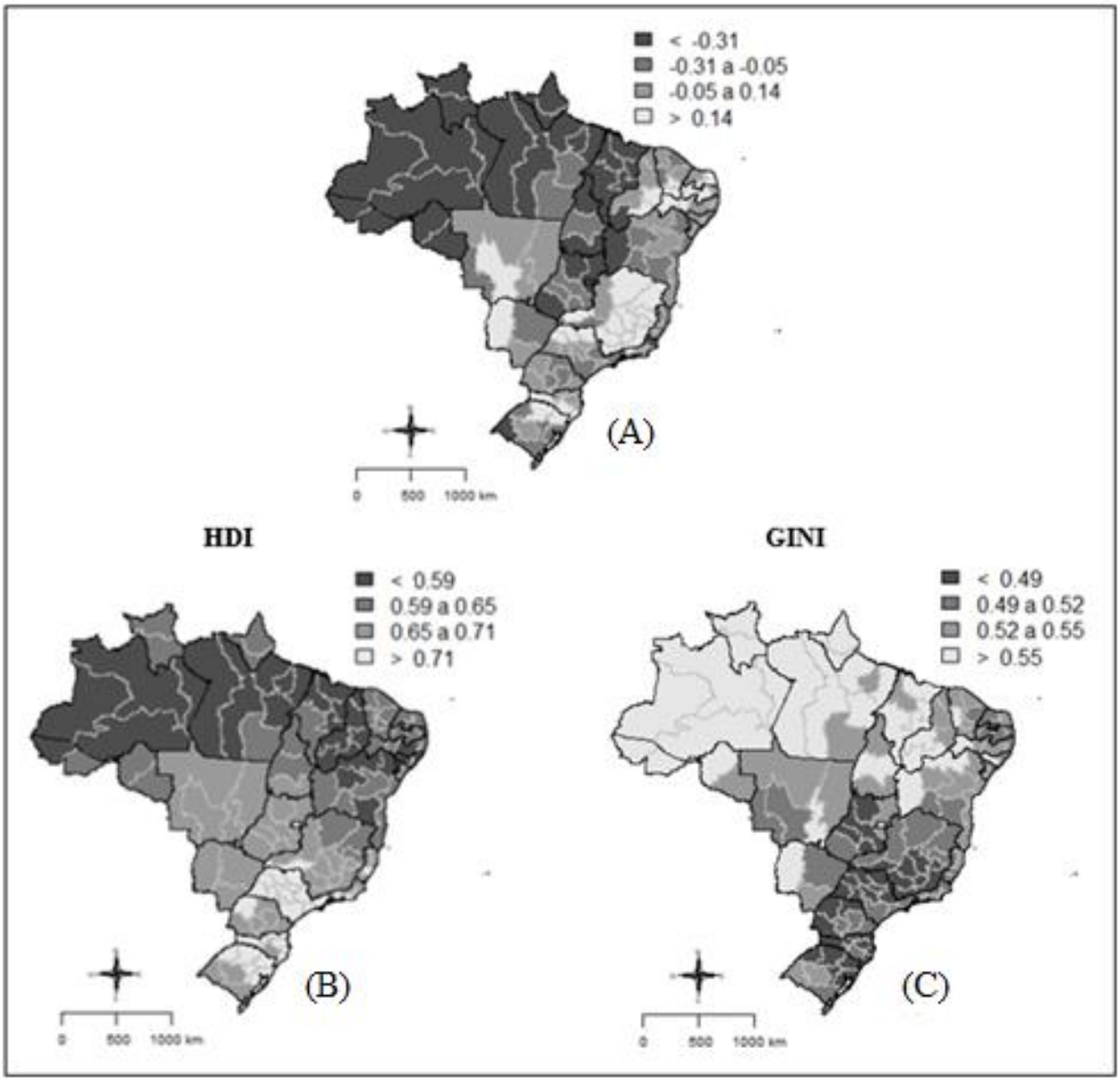

< -0.31
-0.31 a -0.05
-0.05 a 0.14
> 0.14
(A)
0 500 1000 km
HDI
< 0.59
0.59 a 0.65
0.65 a 0.71
> 0.71
(B)
0 500 1000 km
GINI
< 0.49
0.49 a 0.52
0.52 a 0.55
> 0.55
(C)
0 500 1000 km

Table 1 - Difficulty parameter and discrimination parameter of each procedure evaluated performed by OHTs, PMAQ-AB. Brazil. 2015-2018.

Procedures	Difficulty level	Discrimination parameter
Response to spontaneous demand	-5.134	0.826
Ionomer sealant application	-1.989	1.214
Fluoride application	-3.381	1.589
Deciduous tooth extraction	-2.885	2.999
Permanent tooth extraction	-2.953	2.129
Ulotomy/ulectomy	-1.627	1.138
Supragingival scaling, root planning, and coronal polishing	-2.672	2.308
Subgingival scaling, root planning, and coronal polishing	-2.358	0.957
Amalgam filling	-2.016	0.778
Composite filling	-2.858	2.714
Ionomer filling	-2.476	2.131
Prosthetic procedures	1.157	0.843
Prevention or diagnose of oral cancer	2.544	1.023

4.3 Artigo 03

Evolution of dental procedures in Brazil: an analysis of the last cycles of PMAQ-AB

Artigo será submetido ao periódico *Community Dentistry & Oral Epidemiology.*

Fator de Impacto 2.489 (2022-2023)

Title: Evolution of dental procedures in Brazil: an analysis of the last cycles of PMAQ-AB

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Declaration of interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Evolution of dental procedures in Brazil: an analysis of the last cycles of PMAQ-AB

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Abstract

Objectives: The aim of this study was to compare the performance of the Oral Health Teams (OHTs) participating in the 2nd and 3rd cycles of the PMAQ-AB in relation to the dental procedures performed in Brazil and in the Brazilian regions.

Methods: This longitudinal study used secondary data from external evaluation of 2nd and 3rd cycles of PMAQ-AB. A total of 18,115 OHT's participated in second cycle and 22,994 in third cycle. The OHTs participating in two cycles of PMAQ-AB were matched using the National Team Identifier (NIT), resulting in a sample of 15,734 OHTs. Eleven procedures (items) related to preventive, surgical-restorative, prosthetic, and oral cancer prevention or diagnosis procedures were selected were analyzed. The teams were evaluated using a structured questionnaire. Item Response Theory (IRT) was used to estimate the performance scores of the OHTs based on the items in the two cycles. The comparison of the performance of the OHTs, between cycles, in Brazil and Brazilian regions was performed using the Wilcoxon test ($p \leq 0.05$).

Results: Cronbach's alpha coefficient was 0.49, and the score related to the first component explained 40.96% of the items. There was an improvement in the performance of the OHTs between the two cycles in Brazil and Brazilian regions ($p<0.0001$). The mean score in Brazil went from -0.054 in the 2nd cycle to 0.281 in the 3rd cycle. In the North, the average score went from -0.418 to -0.175; in the Northeast from -0.127 to 0.353; in the Midwest from -0.200 to 0.111; in the South from 0.103 to 0.261, and in the Southeast from 0.138 to 0.348, with a greater difference between cycles in the Northeast, Midwest, and North.

Conclusions: Brazil and the Brazilian regions showed improvement in the scores between the two cycles analyzed, with regional differences.

Introduction

Since the creation of the Unified Health System (SUS, in Portuguese), Primary Health Care (PHC) has been the priority strategy to ensure the population's access to health services, allowed an increase in the supply of actions and services, expanding coverage and favoring integrality and equity actions [1]. The institution of the National Oral Health Policy (PNSB, in Portuguese) represented a reorganization of the strategy to expand oral health care at all levels, with PHC as a priority, inserting oral health teams (OHT) in PHC [2]. This insertion resulted in a greater chance of increasing rates of service use, including the performance of dental procedures [3].

Although oral health policies have achieved important advances in recent years, especially the decrease in the prevalence of dental caries [4], the difficulties of access to services are still a major challenge in Brazil [5]. The institution of robust and complex strategies and policies leads to the need to constantly plan and evaluate such policies, in order to verify if the health policy has achieved its objectives [6]. In this context, the National Program for Improvement of Access and Quality of Primary Care (PMAQ-AB, in Portuguese) emerged in 2011 as an important advance to increase access and improve the quality of PHC, institutionalizing the evaluation in the context of SUS [7].

The PMAQ-AB was a payment for performance program that municipalities could qualify their services and improve the quality of services offered to users. Membership was voluntary and professionals from the primary care teams, managers, and users participated in the evaluation process. The program was composed of successive cycles. Each cycle was composed of four phases: adhesion/contractualization, development of actions, external evaluation, and certification/recontractualization [8]. The program had three complete cycles of evaluation: the first cycle occurred 2011 to 2012, the second cycle occurred from 2013 to 2014, and the third cycle occurred from 2017 to 2018 [9].

Evaluating the availability of procedures in PHC is one of the evaluation strategies of public health policies, being a component for the evaluation to services, representing its interaction with the user [10]. In this way, it is relevant to analyze the PMAQ-AB because it is one of the largest initiatives in the world to improve the performance of primary care, which collected data nationwide to induce improved access to oral health services in Brazil [5].

Reis et al. [11] and Fagundes et al. [12] analyzing data from the first cycle of the PMAQ-AB showed that preventive and restorative surgical procedures are more commonly performed by OHTs, and even low performing teams are able to perform them. On the other hand, the actions related to the identification of oral cancer and making of dental prostheses in PHC are performed by OHTs with high performance. Mendes et al. [13] analyzing data from the second cycle, and Scalzo et al. [14] analyzing data from the third cycle, found similar results.

Evidence on dental procedures performed by Brazilian OHTs in PHC, using data from the PMAQ-AB, is limited to studies that only evaluate cycles separately, without comparing them. Hence, the aim of this study was to compare the evaluation cycles of the PMAQ-AB, in relation to the performance of dental procedures by Brazilian OHTs, also comparing according to the Brazilian regions. The hypothesis is that there was an improvement in the OHTs' performance over the cycles of PMAQ-AB when comparing dental procedures, in Brazilian regions.

Materials and Methods

This study was approved by the Research Ethics Committee of Universidade Federal de Minas Gerais, logged under protocol number 02396512.8.0000.5149.

This longitudinal study used secondary data from external evaluation of second and third cycles of PMAQ-AB. A total of 18,115 OHT's participated in second cycle and 22,994 in third cycle. The teams that participated in these two cycles were paired using the National Team Identifier (NIT). NIT an individual identification code for the nationally based team that has the objective of a historical follow-up of the movement of each team through the establishments in the municipality and follow-up of the professionals that work there. Data of the first cycle could not be included in this analysis. The database of this cycle did not include the NIT information, which prevented the pairing of the teams for comparison among the other cycles. Then, the final sample included 15,734 OHTs, that participated in second cycle and in third cycle of PMAQ-AB.

Data were collected during the external evaluation phase, which is characterized by a visit by evaluators to the PHC units and verification of documents to attest to the quality standards established according to norms and protocols established by the Brazilian Ministry of Health. An instrument developed by the Brazilian Ministry of Health, in partnership with Brazilian teaching and research institutions, was used for this purpose, which included

questions related to the structure of dental offices, work processes, management, and service organization.

This study used a total of 11 questions, mostly dichotomous (yes/no), about primary dental healthcare procedures performed by OHTs. These questions included items about surgical-restorative clinical procedures (deciduous tooth extraction, permanent tooth extraction, ulotomy/ulectomy, amalgam filling, composite filling; preventive procedures (fluoride application, supragingival scaling, root planning, and coronal polishing); actions related to the manufacture of dental prostheses (impression and installation); actions related to the prevention or diagnosis of oral cancer and biopsies performed to diagnose oral cancer. For each procedure (item), the performance of OHTs were dichotomized for those OHTs that performed no procedures and other OHTs that performed some type of the procedure.

The Item Response Theory (IRT) model for graded responses [15] was used to estimate the performance scores of OHTs, based on 11 items. The IRT involves a set of mathematical models that relate an individual's probability of response to an article and its latent characteristic, which is a characteristic that cannot be measured directly, such as attitude, satisfaction, and proficiency [16]. The latent construct for this study was the performance of the OHTs, estimated through the answers obtained on the execution or not of 11 selected items of dental procedures.

Descriptive analyses of dental procedures were performed. To confirm the feasibility of IRT application, the first value was calculated from the decomposition of the polychoric correlation matrix, checking its domain. The internal consistency of the scale was also evaluated using Cronbach's alpha. The IRT model allows in-depth analysis of the variables selected to construct the measure, including the level of difficulty and the ability to discriminate. In this sense, the number of dental procedures performed by the teams is not what determines their performance, but rather the difficulty values and the ability to discriminate between items. The discrimination parameter is the ability of the item to differentiate between OHTs with different abilities to perform those procedures. The higher the value, the more the item is able to detect differences between teams. The difference parameter is the minimum ability that the OHT needs to have a 50% probability of performing a given procedure.

The data were organized in Stata Software (StataCorp. 2015. Stata Statistical Software: Version 14. University Station, TX: StataCorp LP). The ltem package for La-tent Variable Modeling and Item Response Analysis [17] of R software v. 4.0.2 [18] was used to analyze the data.

Descriptive analysis and correlation matrix to check the IRT hypothesis, and the latent trace model was used to adjust the IRT model.

After obtaining the performance scores of the second and third cycles of the PMAQ-AB, these scores were compared using Wilcoxon signed-rank test ($p \leq 0.05$), using R software v. 4.0.2 [18] to compare the performance of OHTs in Brazil and Brazilian regions.

Findings

The Cronbach alpha coefficient was 0.49, and the score related to the first component explained 40.96% of the analyzed items, which maintained the IRT unidimensionality hypothesis.

Table 1 shows the discrimination parameter and the difficulty level of each evaluated procedure performed by the participating OHTs in the last two cycles of PMAQ-AB. Difficulty parameters with negative values reveal which items were frequently performed by the OHTs, while positive values reveal items that are less frequently performed by the teams. The items with higher difficulty parameters were those related to impression for prostheses (b=1.178) and installation of prostheses (b=1.243).

Table 2 shows the mean of scores obtained through IRT in the second and third cycle according to the Brazilian regions and Z-values obtained from the Wilcoxon signed-rank test.

The difference in scores between the cycles were: 0.335 for Brazil; 0.243 for the North; 0.48 for the Northeast; 0.311 for the Midwest; 0.158 for the South and 0.21 for the Southeast.

The results of the scores obtained for the IRT analysis show that all regions showed a significant increase in the mean of scores between cycles ($p<0.001$). However, the Northeast, Midwest and North, regions were the ones that presented the greatest evolutions.

Thus, the hypothesis was confirmed. There was a significant increase in OHT performance in Brazil and Brazilian regions, between the second and third cycles of the PMAQ-AB, when compare Brazil and the regions.

Discussion

This study demonstrated an increase in the performance of OHTs when comparing the last two evaluation cycles of the PMAQ-AB. Brazil and the Brazilian regions showed improvement in the performance scores of the OHTs between the two cycles analyzed. These

findings may indicate that the implementation of systematic evaluations of services such as the PMAQ-AB may be related to positive changes in the indicators of access to oral health services in Brazil.

Despite the improvement of in the performance scores of the Brazilian OHTs Regional in two cycles, inequalities remained in oral health at PHC in Brazil.

The number of dental procedures performed has been used as an indicator of service utilization and coverage. Moreover, comparing the performance of OHTs at different times helps to identify the difficulties and potentialities of oral health system, and direct efforts to improve the oral health care of the population to reduce inequalities.

Comparing the effectiveness of the dental procedures between the two cycles it was found that preventive, restorative and surgical procedures presented a high probability of being performed by most of the OHTs. On the other hand, procedures related to prosthetics, presented a lower probability of being performed by the teams. The difficulty in performing procedures for making and installing dental prostheses reveal lack in the completeness of care, and reveal that there has not been much progress in relation to other moments evaluated [11,13-19]. Such procedures demand infrastructure and skilled labor in the service, which may justify their low execution [14].

Our findings are similar to those of Ribeiro et al. [5], who compared the first and second cycles of the PMAQ-AB, regarding the structure and work process of the Brazilian OHTs, including dental procedures, and identified more significant improvements in the Midwest, North, and Northeast regions, and the South and Southeast regions with less expressive numbers. The National Oral Health Policy, provided an increase in the oral health incentive for municipalities with lower HDI. This policy benefited the North and Northeast regions, with increased access and improved infrastructure [20], which may explain the improvement in the indices obtained. Despite the improvement noted, differences still persist among Brazilian regions. Such differences can be justified by the fact that the improvements related to the structure of the health units require financial investments from the management, and the adequacy of the teams' work processes demand the involvement of several actors [21].

Teams that presented lower scores are located in regions with the worst socioeconomic indicators in Brazil. The process of economic development in the North, Northeast and Midwest regions of the country occurred differently from the South and Southeast regions, as well as the

direction of public health funding. In this sense, the slow improvement is a reflection of the variation in the social development of these regions with consequent differences in the epidemiological profiles of oral health [22].

In this regard, structuring and improving public policies that expand and qualify the work process of OHTs will allow an expansion of services and oral health, focused on reducing inequities. Moreover, strengthening the effectiveness of prosthetic procedures in PHC will allow a better response to the epidemiological needs of the population.

The PMAQ-AB makes financial transfers to the municipalities that obtain improvements in their indicators. The program does not establish how the transferred resources should be applied, with the municipalities having autonomy to invest them according to local needs, so these values can be invested in training of teams, improvement in the structure and acquisition of technology [23]. The improvement in performance may find explanation in this fact, since the quantity and quality of care in oral health is related to the availability of structure to perform clinical procedures and qualified human resources [24].

The PMAQ-AB proposed to carry out evaluations with the goal of institutionalizing the practice in primary care, identifying teams with greater difficulties and finding ways to qualify them, reducing barriers that prevent the growth and improvement of the quality of services provided. The PMAQ may well be the largest program in the world in terms of performance evaluation in primary care. And it was instrumental in increasing investment in primary care in Brazil [25].

The use of secondary databases from the second and third evaluation cycle is a limitation of this study, so it is necessary to consider the possibility of errors in the recording of data in the databases, and to consider the possibility of overestimation of the results, since adherence to the PMAQ-AB was voluntary and may have been influenced by the selective adherence of better organized teams and health units. In addition, some variables could not be evaluated due to differences in the program questionnaires during the two cycles of the program.

However, PMAQ-AB was the most robust national evaluation program ever developed in the country, it generated a huge amount of public data on the performance of the teams, promoting a culture of information and transparency. It also generated a new funding stream, providing additional support to the teams while maintaining their decision-making autonomy, which translated into expanded access and PHC services [26].

The use and comparison of data from two evaluative moments of the PMAQ-AB provides important results on the reality of Brazilian OHTs and their evolution that can guide the implementation of measures to continue expanding access and improving the quality of oral health services offered in Brazil.

With the end of the program, it is of fundamental importance to structure a national policy that is able to continuously evaluate the infrastructure of the health units, the work process of the teams, and the experience of all actors; managers, users, and professionals, in order to provide data that help identify the difficulties and barriers to access to health care, aiming to reduce inequalities, giving more access to those who need it most.

Conclusion

The findings of this study revealed an improvement in the performance score of the teams from the second to the third cycle of the program, in all regions of the country. However, regional differences persist.

The institutionalization of health evaluation at the national level, through performance indicators, can identify the teams with greater difficulties and find ways to qualify them, reducing barriers that hinder growth and quality improvement.

References

1. Barros RD, Aquino R, Souza LEPF. Evolution of the structure and results of Primary Health Care in Brazil between 2008 and 2019. Evolução da estrutura e resultados da Atenção Primária à Saúde no Brasil entre 2008 e 2019. *Cien Saude Colet*. 2022;27(11):4289-4301. doi:10.1590/1413-812320222711.02272022

2. Melo EA, Probst LF, Guerra LM, Tagliaferro EP da S, De-Carli AD, Pereira AC. Indicators for dental appointment scheduling in primary health care: a national cross-sectional study. *BMC Public Health*. 2021 Dec;21(1).

3. Corrêa GT, Celeste RK. Associação entre a cobertura de equipes de saúde bucal na saúde da família e o aumento na produção ambulatorial dos municípios brasileiros, 1999 e 2011 [Association between coverage by oral health teams in the family health and the increase in dental care output in Brazilian municipalities, 1999 and 2011]. *Cad Saude Publica*. 2015;31(12):2588-2598. doi:10.1590/0102-311X00000915

4. Souza GC de A, Kusma SZ, Moysés SJ, Roncalli AG. Implementation of the Brazilian National Oral Health Policy and its influence on oral health conditions in Brazilian state capitals in the first decade of the 21st century. *Cad Saude Publica*. 2021;37(12).

5. Ribeiro AGA, Martins RFM, Vissoci JRN, da Silva NC, Rocha TAH, Queiroz RC de S, et al. Progress and challenges in potential access to oral health primary care services in Brazil: A population-based panel study with latent transition analysis. Fontoura Bastos L, editor. *Plos One*. 2021 Mar 16;16(3):e0247101.

6. Bueno AS, Celeste RK. Relationship between Professional Training of Dentists and Outpatient Clinical Production. Braz-Silva PH, editor. *BioMed Research International.* 2022 Mar 20;2022:1–7.

7. Galvão MHR, Roncalli AG. Performance of Brazilian municipalities in the supply of specialized oral health services. *Cad Saude Publica*. 2021;37(1).

8. Brasil. Ministério da Saúde. Secretaria de Atenção à Saúde. Departamento de Atenção Básica. Programa Nacional de Melhoria do Acesso e da Qualidade da Atenção Básica (PMAQ-AB): manual instrutivo. Brasília: Ministério da Saúde, 2015.

9. Wachs, LS, Facchini, LA, Thumé, E, Tomasi, E, Fassa, MEG., & Fassa, AG. Evaluation of the implementation of the School Health Program from the Program for Access and Quality Improvement in Primary Care: 2012, 2014, and 2018. *Cad Saúde Pública*, 2022; 38.

10. Tanaka, OY. Primary health care evaluation: a new approach. *Saúde e Sociedade. 2011*, *20*, 927-934.

11. Reis CM, Matta-Machado AT, Amaral JH, Werneck MA, Abreu MH. Describing the primary care actions of oral health teams in Brazil. *Int J Environ Res Public Health* 2015;12:667-78.

12. Fagundes DM, Thomaz EBAF, Queiroz RC de S, Rocha TAH, Silva NC da, Vissoci JRN, et al. Diálogos sobre o processo de trabalho em saúde bucal no Brasil: uma análise com base no PMAQ-AB. *Cad Saude Publica*. 2018 Sep 6;34(9).

13. Mendes SR, Martins RC, Matta-Machado ATGM, Mattos GCM, Gallagher JE, Abreu MHNG. Dental procedures in Primary Health Care of the Brazilian National Health System. *Int J Environ Res Public Health* 2017;14:1480.

14. Scalzo MTA, Abreu MHNG, Matta-Machado ATG, Martins RC. Oral health in Brazil: What were the dental procedures performed in Primary Health Care? *Plos One*. 2022 Jan 28;17(1):e0263257.

15. Samejima, FA. Estimation of latent ability using a response pattern of gradedscores. Psychometric Monograph. 1968; 1:169. Available in: https://onlinelibrary.wiley.com/doi/10.1002/j.2333-8504.1968.tb00153.x

16. Bhakta B, Tennant A, Horton M, Lawton G, Andrich D. Using item response theory to explore the psychometric properties of extended matching questions examination in undergraduate medical education. *BMC Med Educ* 2005;5:9.

17. Dimitris R. ltm: an R package for Latent Variable Modeling and Item Response Analysis. *Journal of Statistical Software*. 2007; 17:1-25. Available in: https://www.jstatsoft.org/article/view/v017i05

18. R Core Team (2019). R: A language and environment for statistical computing. R Foundation for Statistical Computing, Vienna, Austria. Available in: https://www.R-project.org/

19. Cunha MAGM, Matta-Machado ATG, Lucas SD, Abreu MHNG. Availability of dental prosthesis procedures in brazilian primary health care. *Biomed Res Int* 2018;11:4536707.

20. Chaves SCL, Almeida AMFL, Rossi TRA, Santana SF, Barros SG, Santos CML. Oral health policy in Brazil between 2003 and 2014: scenarios, proposals, actions, and outcomes. *Cien Saude Colet*. 2017;22:1791-803.

21. Lucena EHGD, Lucena CDRXD, Alemán JADS, Pucca GA, Pereira AC, Cavalcanti YW. (2020). Monitoring of oral health teams after National Primary Care Policy 2017. *Rev Saude Publica* 2020:54:99.

22. da Silva JV, Machado FC, Ferreira MA. Social Inequalities and the Oral health in Brazilian Capitals. *Cien Saude Colet*. 2015;20(8):2539-2548. doi:10.1590/1413-81232015208.12052014

23. Rodrigues, AWD., Mello, ECDA., Candeia, RMS., Silva, G., Gomes, LB., & Sampaio, J.. Performance payment to the Primary Care Teams: analysis from the PMAQ-AB cycles. *Saúde em Debate*, 45, 1060-1074.

24. Baumgarten A, Hugo FN, Bulgarelli AF, Hilgert JB. Curative procedures of oral health and structural characteristics of primary dental care. *Rev Saude Publica* 2018;52:35.

25. Macinko J, Harris MJ, Rocha MG. Brazil's National Program for Improving Primary Care Access and Quality (PMAQ): fulfilling the potential of the world's largest payment for performance system in primary care. *The Journal of ambulatory care management*, 40(2 Suppl), S4.

26. Dantas Gurgel G Junior, Kristensen SR, da Silva EN, et al. Pay-for-performance for primary health care in Brazil: A comparison with England's Quality Outcomes Framework and lessons for the future. *Health Policy*. 2023;128:62-68. doi:10.1016/j.healthpol.2022.11.004

Table 1 - Difficulty level and discrimination parameter of each procedure evaluated performed by OHTs in second and third cycle, PMAQ-AB. Brazil.

Procedures	Difficulty level	Discrimination parameter
Fluoride application	-4.109	1.214
Deciduous tooth extraction	-3.070	2.268
Permanent tooth extraction	-3.035	1.917
Ulotomy/ulectomy	-1.723	0.700
Supragingival scaling, root planning, and coronal polishing	-3.105	1.559
Amalgam filling	-4.345	0.400
Composite filling	-3.283	1.708
Impression for prostheses	1.178	8.977
Installation of prostheses	1.243	10.209
Prevention or diagnose of oral cancer	-3.276	0.680
Biopsies	-2.062	0.417

Table 2 – Mean and standard deviation of IRT scores between second and third cycles and Z-values, obtained by Brazilian region, PMAQ-AB. Brazil.

Region	2nd cycle	3rd cycle	z-value *
Brazil	-0.054 (0.724)	0.281 (0.677)	-50.809
North	-0.418 (0.729)	-0.175 (0.668)	-9.609
Northeast	-0.127 (0.684)	0.353 (0.670)	-43.532
Midwest	-0.200 (0.786)	0.111 (0.696)	-14.284
South	0.103 (0.662)	0.261 (0.632)	-11.393
Southeast	0.138 (0.728)	0.348 (0.648)	-19.413

* ($p < 0.001$)

5 CONSIDERAÇÕES FINAIS

Os resultados obtidos e apresentados nos artigos demonstram que as ESB brasileiras realizam a maioria dos procedimentos odontológicos preconizados pela Ministério da Saúde na APS, como raspagem e polimento supra gengival, restaurações em resina e extração de dentes permanentes. Tais procedimentos possuem alta probabilidade de execução, mesmo por equipes com menores escores de desempenho.

Os procedimentos com menor probabilidade de realização são os itens relacionados à moldagem, instalação e cimentação de próteses dentárias, e monitoramento de casos de câncer de boca. A execução destes procedimentos não tem acompanhado as necessidades epidemiológicas da população, e o crescimento da produção de próteses tem sido discreto, revelando uma lacuna na integralidade do cuidado.

Evidenciou-se que é necessário avançar, estimular e capacitar as ESB para a confecção de instalação de próteses dentárias e monitoramento de casos de câncer de boca, pois possuem alta demanda e são capazes de impactar positivamente na qualidade de vida e mortalidade da população brasileira.

Nesse contexto, estabelecer parcerias com universidades e faculdades para oferecer cursos e treinamentos direcionados aos profissionais das ESB, produzir materiais educativos claros e informativos, e aproveitar laboratórios e equipamentos disponíveis, emerge como uma abordagem eficaz para aprimorar as habilidades dessas equipes. Tais ações podem incentivar as equipes a realizar com mais frequência os procedimentos associados à confecção de próteses dentárias e o acompanhamento de casos de câncer bucal.

As ESB localizadas nas regiões Sul, Sudeste e Nordeste realizam um maior número de procedimentos odontológicos na APS, enquanto as equipes do Norte e Centro-Oeste realizam, em média, menos procedimentos, esta diferença pode ser explicada pelo nível de desenvolvimento das regiões.

Apesar da melhora do Índice de Desenvolvimento Humano Municipal (IDH), em todas as regiões, o Norte e o Nordeste ainda têm o IDH mais baixo no país, o que pode impactar na organização da atenção à saúde.

Maiores níveis de dificuldade estão relacionados, aos procedimentos com menores probabilidade de realização. Em relação ao parâmetro de discriminação, os

procedimentos com maior valor deste parâmetro são considerados os menos complexos, devido às altas probabilidades de realização observadas.

Esses achados indicam que os itens incluídos na estimativa do desempenho das ESB foram apropriados para diferenciar equipes com escores mais baixos e pouco eficientes na diferenciação entre aqueles com um melhor desempenho, uma vez que muitos dos procedimentos avaliados são realizados pela maioria das equipes.

A comparação dos dois últimos ciclos do PMAQ-AB, revelou uma melhora no desempenho das ESBs, no Brasil e nas regiões brasileiras, com destaque para o Norte, Nordeste e Centro-Oeste, mesmo que ainda persistam diferenças regionais, visto que os resultados alcançados por essas regiões ainda são inferiores aos alcançados por Sul e Sudeste.

A melhora no desempenho pode indicar que a implantação de avaliações sistemáticas de serviços, como o PMAQ-AB, pode estar relacionada a mudanças positivas nos indicadores de acesso aos serviços de saúde bucal no Brasil. Os resultados deste estudo podem ajudar a entender como as políticas de avaliação afetam a eficácia do sistema de pagamento baseado em desempenho, implementado pelo PMAQ-AB nos serviços de saúde. Isso ocorre porque notamos uma melhoria nos indicadores medidos entre o segundo e o terceiro ciclos de avaliação.

A institucionalização da avaliação em saúde em nível nacional, por meio de indicadores de desempenho, pode identificar as equipes com maiores dificuldades e encontrar formas de qualificá-las, reduzindo barreiras que impedem o crescimento e a melhoria da qualidade.

O PMAQ-AB encorajou o gerenciamento adequado da oferta de serviços de forma que as metas estabelecidas e as reais necessidades de saúde da população sejam atendidas e alcançadas com uma política de incentivo programada que impacte diretamente no financiamento, gestão da rede de serviços, apoio institucional, planejamento e organização de processos de trabalho.

Apesar do término do programa, ainda é de extrema necessidade e relevância, a estruturação e implementação de uma política nacional que seja capaz de avaliar continuamente a infraestrutura das unidades de saúde, o processo de trabalho das equipes e a experiência de todos os atores envolvidos no processo de cuidado - gestores, usuários e profissionais - a fim de fornecer dados que ajudem a

identificar as dificuldades e barreiras de acesso à saúde, qualificar os serviços para reduzir as desigualdades, e proporcionar acesso a quem mais precisa.

A avaliação em saúde pode gerar resultados capazes de subsidiar tomada de decisões e aprimorar a eficácia e eficiência dos serviços de saúde. Neste sentido, novas pesquisas, que avaliem e identifiquem fatores internos e externos ao serviço, como organização da agenda, apoio matricial, perfil dos profissionais e condições sociodemográficas, e se esses fatores estão associados ao desempenho das equipes, podem complementar nossos resultados e indicar caminhos e soluções que qualifiquem o processo de trabalho das equipes e aprimorem a estrutura dos serviços.

REFERÊNCIAS

Brasil. Ministério da Saúde. Cadernos de Atenção Básica; 17. Secretaria de Atenção à Saúde. Departamento de Atenção Básica. Saúde Bucal Série A. Normas e Manuais Técnicos – Brasília : Ministério da Saúde, 2008. 92 p.

BRASIL. PORTARIA Nº 2.488, 21 de outubro de 2011. Aprova a Política Nacional de Atenção Básica, estabelecendo a revisão de diretrizes e normas para a organização da Atenção Básica, para a Estratégia Saúde da Família (ESF) e o Programa de Agentes Comunitários de Saúde (PACS). 2011a.

BRASIL. Ministério da Saúde. Portaria no 1.654, de 19 de julho de 2011. Institui, no âmbito do Sistema Único de saúde, o Programa Nacional de Melhoria do Acesso e da Qualidade da Atenção Básica (PMAQ-AB) e o Incentivo Financeiro do PMAQ-AB, denominado Componente de Qualidade do Piso de Atenção Básica Variável - PAB Variável. 2011b.

BRASIL. Ministério da Saúde. Secretaria de Atenção à Saúde. Departamento de Atenção Básica. Política Nacional de Atenção Básica. Brasília: Ministério da Saúde; 2012a.

BRASIL. Ministério da Saúde. Secretaria de Atenção à Saúde. Departamento de Atenção Básica. Programa Nacional de Melhoria do Acesso e da Qualidade da Atenção Básica (PMAQ): Manual instrutivo – Brasília: Ministério da Saúde, 2012b.

BRASIL. Ministério da Saúde. Secretaria de Atenção à Saúde. Departamento de Atenção Básica. Instrumento de Avaliação Externa para as Equipes de Saúde Bucal (Equipe de Saúde Bucal e Equipe Parametrizada de Saúde Bucal). Programa Nacional de Melhoria do Acesso e da Qualidade da Atenção Básica (PMAQ) – Brasília: Ministério da Saúde, 2017.

BHAKTA, Bipin et al. Using item response theory to explore the psychometric properties of extended matching questions examination in undergraduate medical education. **BMC Medical Education**, v. 5, n. 1, p. 9, 2005.

BOURION-BÉDÈS, Stéphanie et al. Combination of classical test theory (CTT) and item response theory (IRT) analysis to study the psychometric properties of the French version of the Quality of Life Enjoyment and Satisfaction Questionnaire-Short Form (Q-LES-Q-SF**). Quality of Life Research**, v. 24, n. 2, p. 287-293, 2015.

CASOTTI, Elisete et al. Atenção em Saúde Bucal no Brasil: uma análise a partir da Avaliação Externa do PMAQ-AB. **Saúde em Debate**, v. 38, p. 140-157, 2014.

CAVALCANTI, Pauline; FERNANDEZ, Michelle. Programa de Melhoria do Acesso e da Qualidade da Atenção Básica: uma análise das principais mudanças normativas. **Physis: revista de saúde coletiva**, v. 30, p. e300323, 2020.

CUNHA, João Paulo Pinto et al. Sistema único de saúde: princípios. **Cadernos de Saúde**, v. 1, p. 11-26, 2001.

DOS ANJOS, Fabrícia et al. Equipes de saúde bucal no Brasil: avanços e desafios **Ciência, Cuidado e Saúde**, 2011.

FAGUNDES, Daniela Malagoni et al. Diálogos sobre o processo de trabalho em saúde bucal no Brasil: uma análise com base no PMAQ-AB. **Cadernos de Saúde Pública**, v. 34, 2018.

GOES, Paulo Sávio Angeiras de et al. Avaliação da atenção secundária em saúde bucal: uma investigação nos centros de especialidades do Brasil. **Cadernos de Saúde Pública**, v. 28, p. s81-s89, 2012.

HATISUKA, Marla Fabiula de Barros; MOREIRA, Ricardo Castanho; CABRERA, Marcos Aparecido Sarria. Relação entre a avaliação de desempenho da atenção básica e a mortalidade infantil no Brasil. **Ciência & Saúde Coletiva**, v. 26, p. 4341-4350, 2021.

IBGE. Divisão Regional do Brasil em Regiões Geográficas Imediatas e Regiões Geográficas Intermediárias [homepage]. Rio de Janeiro: Instituto Brasileiro de Geografia e Estatística; 2017.

JUNQUEIRA, Simone Rennó; PANNUTI, Cláudio Mendes; RODE, Sigmar de Mello. Oral Health in Brazil-Part I: public oral health policies. **Brazilian Oral Research**, v. 22, p. 8-17, 2008.

JOHNSON, Richard Arnold et al. Applied multivariate statistical analysis. 2002.

MARTINS, Renata Castro et al. Relationship between Primary and Secondary Dental Care in Public Health Services in Brazil. **PloS one**, v. 11, n. 10, p. e0164986, 2016.

MENDES, Suellen R. et al. Dental procedures in primary health care of the Brazilian National Health System. **International Journal of Environmental Research and Public Health**, v. 14, n. 12, p. 1480, 2017.

MICLOS Paula Vitali et al. Evaluation of the performance of actions and outcomes in primary health care. **Rev Saude Publica**. 2017; 51:86.

MINISTÉRIO DA SAÚDE (BR). CONSELHO NACIONAL DE SAÚDE. Resolução nº 466, de 12 de dezembro de 2012. Diretrizes e normas regulamentadoras de pesquisas envolvendo seres humanos. **Diário Oficial da União [da] República Federativa do Brasil**, v. 150, n. 112 Seção 1, p. 59-62, 2013.

OLIVEIRA, Lidiane da Silva Gomes et al. Saúde bucal na estratégia saúde da família: percepções de profissionais e cuidadores familiares. **Mundo saúde (Impr.),** v. 34, n. 1, p. 65-72, 2010.

PAIM, Jairnilson et al. The Brazilian health system: history, advances, and challenges. **The Lancet**, v. 377, n. 9779, p. 1778-1797, 2011.

PINTO, Hêider Aurélio; SOUSA, Allan Nuno Alves de; FERLA, Alcindo Antônio. O Programa Nacional de Melhoria do Acesso e da Qualidade da Atenção Básica: várias faces de uma política inovadora. **Saúde em Debate**, v. 38, p. 358-372, 2014.

PUCCA JUNIOR, Gilberto Alfredo et al. Oral health policies in Brazil. **Brazilian Oral Research**, v. 23, p. 9-16, 2009.

R Core Team (2019). R: A language and environment for statistical computing. **R Foundation for Statistical Computing**, Vienna, Austria. Available in: https://www.R-project.org/

REIS, Clarice Magalhães Rodrigues et al. Describing the primary care actions of oral health teams in Brazil. **International journal of environmental research and public health**, v. 12, n. 1, p. 667-678, 2015.

REIS, Clarice Magalhães Rodrigues. Análise do desempenho das equipes de saúde bucal na estratégia saúde da família no Brasil : um estudo misto. 2016. 87 f., enc. Tese (doutorado) - Universidade Federal de Minas Gerais, Faculdade de Odontologia.

REIS, Clarice Magalhães Rodrigues dos et al. Primary dental care evaluation in Brazil: an item response theory approach. **Journal of public health dentistry**, v. 77, n. 4, p. 317-324, 2017.

RIBEIRO, Ana Graziela Araujo et al. Progress and challenges in potential access to oral health primary care services in Brazil: A population-based panel study with latent transition analysis. **Plos one**, v. 16, n. 3, p. e0247101, 2021.

TANAKA, Oswaldo Yoshimi. Primary health care evaluation: a new approach. **Saúde e Sociedade**, v. 20, p. 927-934, 2011.

TANAKA, Oswaldo Yoshimi; TAMAKI, Edson Mamoru. The role of evaluation in decision-making in the management of health services. **Ciência & Saúde Coletiva**, v. 17, n. 4, p. 821, 2012..

VIEIRA-MEYER, Anya Pimentel Gomes Fernandes et al. Infrastructure and work process in primary health care: PMAQ in Ceará. **Revista de Saúde Pública**, v. 54, 2020.

WACHS, Louriele Soares et al. Evaluation of the implementation of the School Health Program from the Program for Access and Quality Improvement in Primary Care: 2012, 2014, and 2018. **Cadernos de Saúde Pública**, v. 38, 2022.

APÊNDICE A – Atividades realizadas durante o Doutorado

Aluna: MARIA TEREZA DE ABREU SCALZO

Número de registro: 2019711120

Data Final para Conclusão: 31/07/2023

Atividades Acadêmicas Cursadas									
Ano/Sem.	Descrição	TUR	NAT	CR	CH	FR	NOTA	CONC	SF
2019/2	DIP FAO802 - ESTAGIO DOCENTE I	ED8	OP	03	45	S	90.0	A	A
2019/2	DIP OSP813 - PESQUISA EM SAUDE COLETIVA I	A	OB	06	90	S	95.0	A	A
2019/2	DIP OSP816 - METODOLOGIA DA PESQUISA EM ODONTOLOGIA II	A	OP	02	30	S	80.0	B	A
2019/2	DIP OTI804 - NORMALIZAÇÃO BIBLIOGRÁFICA	A	EL	02	30	S	100.0	A	A
2020/1	DIP FAO803 - ESTAGIO DOCENTE II	SC7	OP	03	45	S	94.0	A	A
2020/1	DIP FAO806 - SEMINARIOS DE PESQUISA EM ODONTOLOGIA III: Apresentação de projetos de pesquisa	DOT	OP	03	45	S	97.0	A	A
2020/1	DIP FAO807 - SEMINARIOS DE PESQUISA EM ODONTOLOGIA IV: Apresentações dos projetos de pesquisa dos alunos	DOT	OP	03	45	S	100.0	A	A
2020/1	DIP OSP814 - PESQUISA EM SAUDE COLETIVA II	DOT	OB	06	90	S	100.0	A	A
2020/2	DIP MPS927 - POLITICAS DE SAUDE E ESTADO	A	EL	04	60	S	96.0	A	A
2021/1	DIP FAO809 - BIOESTATÍSTICA APLICADA À PESQUISA ODONTOLÓGICA II	A	OP	04	60	S	100.0	A	A
2021/1	DIP SCA801 - EPIDEMIOLOGIA II	A	OP	3	45	S	100.0	A	A
2021/2	ETF GER000 - ELABORACAO DE TRABALHO FINAL								
2022/1	EQP ODO005 - EXAME DE QUALIFICAÇÃO		OB						A
2022/1	ETF GER000 - ELABORACAO DE TRABALHO FINAL								

Atividades Acadêmicas Cursadas									
Ano/Sem.	Descrição	TUR	NAT	CR	CH	FR	NOTA	CONC	SF
2022/2	ETF GER000 - ELABORACAO DE TRABALHO FINAL								
2023/1	ETF GER000 - ELABORACAO DE TRABALHO FINAL								

** Atividades utilizadas como origem de dispensa

Exame de Qualificação

Resultado Final: APROVADO Data da Realização: 09/05/2022 00:00:00

Orientação:

Renata de Castro Martins (Orientador)
Mauro Henrique Nogueira Guimaraes de Abreu (Coorientador)

Integralização

Créditos Exigidos: 31 Créditos Cursados: 39 Créditos aproveitados/dispensados: 0

Créditos Utilizados para a Integralização: 31

Correspondência Carga Horária/Crédito: 15 Horas / 1 Crédito

Pós - Graduado: NÃO

Publicação de artigo científico

Scalzo MTA, Abreu MHNG, Matta-Machado ATG, Martins RC. Oral health in Brazil: What were the dental procedures performed in Primary Health Care? *PLoS ONE* 2022 17(1): e0263257. https://doi.org/10.1371/journal.pone.0263257

Scalzo MTA, Matta-Machado ATG, Abreu MHNG, Martins RC. Structural characteristics of oral health services in Brazilian Primary Health Care. *Braz Oral Res.* 2021;35:e023. Published 2021 Feb 12. doi:10.1590/1807-3107bor-2021.vol35.0023

Freitas, DAS, Scalzo, MTA.; Martins, RC. Análise das exodontias realizadas na atenção primária da Região Metropolitana de Belo Horizonte. *Arquivos em Odontologia*, [S. l.], v. 56, 2020. DOI: 10.7308/aodontol/2020.56. e27.

Artigo científico submetido:

Scalzo MTA, Abreu MHNG, Mambrini JVM,Pinheiro LC, Matta-Machado ATG, Martins RC. Performance evaluation of Oral Health Teams in Brazil: An Item Response Theory approach. *Medical Care*

Artigo científico em preparação para submissão:

Scalzo MTA, Abreu MHNG, Mambrini JVM, Matta-Machado ATG, Martins RC. Evolution of dental procedures in Brazil: an analysis of the last cycles of PMAQ-AB. *Community Dentistry and Oral Epidemiology*.

Publicação de resumo em anais de eventos científicos

Scalzo M.T.A, Mambrini J.V.M, Machado A.T.G.M, Abreu M.H.N.G, Martins R.C. Evolução dos procedimentos odontológicos no Brasil: Uma análise dos dois últimos ciclos do PMAQ-AB. In: XVI Encontro Científico da FAO UFMG, 2023. Anais do XV Encontro Científico da FAO UFMG, Arquivos em Odontologia *(No prelo).*

Scalzo M.T.A, Mambrini J.V.M, Pinheiro L.C, Machado A.T.G.M, Abreu M.H.N.G, Martins R.C. Análise da relação dos aspectos contextuais com o desempenho das

Equipes de Saúde Bucal no Brasil. In: 39ª Reunião Anual da SBPqO, 2022. Anais da 39ª Reunião Anual da SBPqO - Braz Oral Res 2022;36 (suppl 1)

SCALZO, M. T. A.; MAMBRINI, J. V. M.; MATTA-MACHADO, A. T. G.; ABREU, M. H. N. G.; MARTINS, R. C. Avaliação do desempenho das Equipes de Saúde Bucal no Brasil: uma abordagem da Teoria de Resposta ao Item. In: 38ª Reunião Anual da SBPqO, 2021. Anais da 38ª Reunião Anual da SBPqO Virtual - Braz Oral Res 2021;35 (suppl 1)

SCALZO, M. T. A.; MATTA-MACHADO, A. T. G.; ABREU, M. H. N. G.; MARTINS, R. C. Procedimentos odontológicos realizados pelas equipes de saúde bucal na atenção primária a saúde. In: XV Encontro Científico da FAO UFMG, 2021. Anais do XV Encontro Científico da FAO UFMG, Arquivos em Odontologia, v. 57: Suplemento, 2021.

MAMBRINI, J. V. M.; PINHEIRO, L. C.; SCALZO, M. T. A.; ABREU, M. H. N. G.; MATTA-MACHADO, A. T. G.; MARTINS, R. C. Teoria de Resposta ao Item e mapas temáticos na avaliação de equipes de saúde bucal (ESB). In: 11 Congresso Brasileiro de Epidemiologia; 2021, Fortaleza/CE. Anais do 11 Congresso Brasileiro de Epidemiologia; 2021.

SCALZO, M. T. A.; MATTA-MACHADO, A. T. G.; ABREU, M. H. N. G.; MARTINS, R. C. Avaliação das características estruturais e de ambiência dos serviços de saúde bucal participantes do 2º ciclo do PMAQ-AB. In: 36° Reunião Anual da Sociedade Brasileira de Pesquisa Odontológica, 2019, Campinas. Anais - Braz Oral Res, 2019;33 (suppl 1)

Participação em banca de defesa de Trabalho de Conclusão de curso

Aluno: DANIEL SABADINI DE FREITAS
MARTINS, RC.; SCALZO, MTA. Análise das exodontias realizadas na Atenção Primária da Região Metropolitana de Belo Horizonte. 2019. Trabalho de Conclusão de Curso (Graduação em Odontologia) - Universidade Federal de Minas Gerais.

Participação em banca de avaliação de trabalhos

Avaliadora de trabalhos - Comissão Avaliadora do XV Encontro Científico da FAO UFMG. 2021. Universidade Federal de Minas Gerais.

Participação em eventos científicos

XVI Encontro Cientifico da Faculdade de Odontologia/UFMG - Participação com apresentação de resumo e ouvinte em 2023.

39ª Reunião Anual da SBPqO - Participação com apresentação de resumo e ouvinte em 2022.

38ª Reunião Anual da SBPqO - Participação com apresentação de resumo e ouvinte em 2021.

XV Encontro Cientifico da Faculdade de Odontologia/UFMG - Participação com apresentação de resumo e ouvinte em 2021.

37ª Reunião Anual da SBPqO - Participação como ouvinte em 2020.

36ª Reunião Anual da SBPqO - Participação com apresentação de resumo e ouvinte em 2019.

ANEXO A – Comprovante de aprovação no COEP do banco de dados do 1º Ciclo

Plataforma Brasil - Ministério da Saúde

Universidade Federal de Minas Gerais

PROJETO DE PESQUISA

Título: AVALIAÇÃO EXTERNA DAS EQUIPES DA ATENÇÃO BÁSICA NO ÂMBITO DO PROGRAMA NACIONAL DE MELHORIA DO ACESSO E DA QUALIDADE DA ATENÇÃO

Área Temática:

Pesquisador: Antonio Thomaz Gonzaga da Matta Machado **Versão:** 2

Instituição: Universidade Federal de Minas Gerais ((UFMG)) **CAAE:** 02396512.8.0000.5149

PARECER CONSUBSTANCIADO DO CEP

Número do Parecer: 28804

Data da Relatoria: 30/05/2012

Apresentação do Projeto:

No Brasil, frente à importância do tema qualidade em saúde, no ano de 2011, o Ministério da Saúde propõe mudanças nas diretrizes da atenção primária à saúde com o objetivo de incentivar os gestores locais do Sistema Único de Saúde a melhorar o padrão de qualidade da assistência oferecida aos usuários do SUS nas Unidades Básicas de Saúde e por meio das equipes de Saúde da Família. Neste contexto, inscreve-se o Programa de Melhoria do Acesso e da Qualidade da AB PMAQ-AB, cujo objetivo é apoiar tecnicamente e induzir conomicamente a ampliação do acesso e a melhoria da qualidade da Atenção Básica, garantindo um padrão de qualidade comparável e passível de acompanhamento público.Assim, essa pesquisa se insere na terceira fase do PMAQ-AB, que consiste na avaliação externa das equipes de saúde e gestão da atenção básica, em que se realizará um conjunto de ações para averiguar o acesso da população aos serviços de saúde e a qualidade das equipes da Atenção Básica, que aderiram ao Programa. Além disso, serão verificadas as condições de infraestrutura de todas as unidades básicas de saúde dos estados do Acre, Roraima e mesorregiões de Minas Gerais e São Paulo.

Uma avaliação inicial dos problemas que apresentam a atenção primária no Brasil, como a precariedade da rede física, com parte expressiva de UBS em situação inadequada; ambiência pouco acolhedora das UBS, transmitindo aos usuários uma impressão de que os serviços ofertados são de baixa qualidade e negativamente direcionados à população pobre; inadequadas condições de trabalho para os profissionais, comprometendo sua capacidade de intervenção e satisfação com o trabalho; necessidade de qualificação dos processos de trabalho das equipes de AB, caracterizados de maneira geral, pela sua baixa capacidade de realizar o acolhimento dos problemas agudos de saúde; pela insuficiente integração dos membros das equipes; e pela falta de orientação do trabalho em função de prioridades, metas e resultados, definidos em comum acordo pela equipe, gestão municipal e comunidade; instabilidade das equipes e elevada rotatividade dos profissionais, comprometendo o vínculo, a continuidade do cuidado e a integração da equipe; incipiência dos processos de gestão centrados na indução e acompanhamento da qualidade; sobrecarga das equipes com número excessivo de pessoas sob sua responsabilidade, comprometendo a cobertura e qualidade de suas ações; e pouca integração das equipes de AB com a rede de apoio diagnóstico e terapêutico e com os outros pontos da Rede de Atenção à Saúde (RAS) são os pressupostos que orientaram a referida pesquisa.

Objetivo da Pesquisa:

Objetivo Primário:

. Realizar a avaliação externa das equipes de atenção básica no âmbito do PMAQ-AB, de acordo com a Portaria 1.654/19/07/2011;. Realizar um censo para avaliar as condições de infraestrutura de todas as UBS em funcionamento na totalidade dos municípios brasileiros..Induzir a ampliação do acesso e a melhoria da qualidade da atenção básica, com garantia de um padrão de qualidade comparável nacional, regional e localmente de maneira a permitir maior transparência e efetividade das ações governamentais direcionadas à Atenção Básica em Saúde.

Objetivo Secundário:

I - Ampliar o impacto da AB sobre as condições de saúde da população e sobre a satisfação dos seus usuários, por meio de estratégias de facilitação do acesso e melhoria da qualidade dos serviços e ações da AB; II - Fornecer padrões de boas práticas e organização das UBS que norteiem a melhoria da qualidade da AB; III - Promover maior conformidade das UBS com os princípios da AB, aumentando a efetividade na melhoria das condições de saúde, na satisfação dos usuários, na qualidade das práticas

de saúde e na eficiência e efetividade do sistema de saúde; IV - Promover a qualidade e inovação na gestão da AB, fortalecendo os processos de Autoavaliação, Monitoramento e Avaliação, Apoio Institucional e Educação Permanente nas três esferas de governo;V - Melhorar a qualidade da alimentação e uso dos Sistemas de Informação como ferramenta de gestão da AB;VI - Institucionalizar uma cultura de avaliação da AB no SUS e de gestão com base na indução e acompanhamento de processos e resultados; eVI - Estimular o foco da AB no usuário, promovendo a transparência dos processos de gestão, a participação e controle social e a responsabilidade sanitária dos profissionais e gestores de saúde com a melhoria das condições de saúde e satisfação dos usuários.

Avaliação dos Riscos e Benefícios:

Riscos:
Na medida em que os sujeitos da pesquisa participam dando informações de natureza opinativa e não pessoal, sobre as condições de funcionamento da atenção básica, não existe risco previsível nem qualquer constrangimento de ordem pessoal para os participantes. Ainda assim,os participantes responderão às questões, apenas se o desejarem, podendo desistir de participar do estudo em qualquer momento. Ademais, no relatório técnico da pesquisa, os entrevistados não serão identificados nominalmente.
Benefícios:
Esta pesquisa, ao propor avaliar o desempenho da ABS representa uma iniciativa relevante para o Sistema Único de Saúde-SUS e para a
população brasileira. Construir um sistema de monitoramento que contemple mecanismo de premiação ao melhor desempenho e apoio técnico-científico sistêmicos pode estimular a melhoria nas Unidades Básicas de Saúde-UBS/Saúde da Família-SF e criar um ciclo virtuoso de promoção de equidade e cobertura universal em saúde nos territórios dos serviços de saúde.

Comentários e Considerações sobre a Pesquisa:

Para este projeto, optou-se pelo delineamento transversal, com abordagem qualitativa e quantitativa, com aplicação de questionário aos seguintes atores: responsável / coordenador da unidade de saúde; amostra de usuários presentes na unidade de saúde que atendam ao perfil de mães ou responsáveis por crianças menores de sete anos residentes e idosos com 65 anos ou mais residentes na área de abrangência da unidade de saúde.No que diz respeito ao processo de avaliação externa vinculado ao PMAQ, todas as Unidades de Saúde onde atuam as equipes indicadas pela gestão municipal para o processo de avaliação serão incluídas no estudo. Essas unidades foram identificadas pelo gestor municipal por ocasião da adesão ao PMAQ-AB. As equipes de saúde e gestão da atenção serão certificadas quanto ao seu desempenho, por meio da verificação de evidências para um conjunto de padrões previamente determinados pelas instituições de ensino responsáveis pela realização da pesquisa. Também se realizará uma avaliação, cuja finalidade é apoiar a gestão local onde se contemplará avaliação da rede local de saúde pelas equipes de atenção
básica, avaliação da satisfação do usuário e estudo de base populacional sobre aspectos de acesso, utilização e qualidade da atenção básica em Saúde. Quanto ao censo das condições de infraestrutura das UBS, todas as unidades dos estados do Acre, Rondônia e mesorregiões de Minas Gerais e de São Paulo deverão ser avaliadas em sua totalidade, tanto aquelas localizadas na zona urbana quanto na zona rural. (Anexo 1)

Considerações sobre os Termos de apresentação obrigatória:

TCLE claro, em forma de convite, garante anonimato e não participação sem prejuizo.
Apresenta instrumento de coleta de dados.
Esclarece no TCLE fonte de financiamento.

Recomendações:

Projeto aprovado

Conclusões ou Pendências e Lista de Inadequações:

Diligências atendidas

Situação do Parecer:

Aprovado

Necessita Apreciação da CONEP:

Não

Considerações Finais a critério do CEP:

Projeto aprovado conforme parecer.

ANEXO B – Comprovante de aprovação no COEP do banco de dados do 2º Ciclo

UNIVERSIDADE FEDERAL DE MINAS GERAIS

Plataforma Brasil

PARECER CONSUBSTANCIADO DO CEP

DADOS DO PROJETO DE PESQUISA

Título da Pesquisa: AVALIAÇÃO EXTERNA DAS EQUIPES DA ATENÇÃO BÁSICA NO ÂMBITO DO PROGRAMA NACIONAL DE MELHORIA DO ACESSO E DA QUALIDADE DA ATENÇÃO BÁSICA

Pesquisador: Antonio Thomaz Gonzaga da Matta Machado

Área Temática:

Versão: 3

CAAE: 02396512.8.0000.5149

Instituição Proponente: Universidade Federal de Minas Gerais

Patrocinador Principal: Secretaria de Atenção a Saúde

DADOS DO PARECER

Número do Parecer: 1.275.911

Apresentação do Projeto:

A principal estratégia de configuração da Atenção Básica em Saúde- ABS no Brasil é a Saúde da Família, que tem recebido importantes incentivos financeiros visando a ampliação da cobertura populacional, a reorganização da atenção e uma cobertura populacional por outros modelos de atenção básica, que pode variar entre 60% e 80%. (Ministério da Saúde, 2011) Entretanto, muitos desafios persistem e "indicam a necessidade de articulação de estratégias de acesso aos demais níveis de atenção à saúde, de forma a garantir o princípio da integralidade, assim como a necessidade permanente de ajuste das ações e serviços locais de saúde, visando à apreensão ampliada das necessidades de saúde da população e à superação das iniquidades entre as regiões do país"(Matta e Morosini, 2009). Avaliar o desempenho da ABS representa uma iniciativa relevante para o Sistema Único de Saúde-SUS e para a população brasileira. Trata-se de estudo com delineamento transversal, de abordagem qualitativa e quantitativa, com aplicação de questionário aos seguintes atores: responsável / coordenador da unidade de saúde; amostra de usuários presentes na unidade de saúde que atendam ao perfil de mães ou responsáveis por crianças menores de sete anos residentes e idosos com 65 anos ou mais residentes na área de abrangência da unidade de saúde. No que diz respeito ao processo de avaliação externa vinculado ao PMAQ, todas as Unidades de Saúde onde atuam as equipes

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indicadas pela gestão municipal para o processo de avaliação serão incluídas no estudo. Essas unidades foram identificadas pelo gestor municipal por ocasião da adesão ao PMAQ-AB. As equipes de saúde e gestão da atenção serão certificadas quanto ao seu desempenho, por meio da verificação de evidências para um conjunto de padrões previamente determinados pelas instituições de ensino responsáveis pela realização da pesquisa. Também se realizará uma avaliação, cuja finalidade é apoiar a gestão local onde se contemplará avaliação da rede local de saúde pelas equipes de atenção básica, avaliação da satisfação do usuário e estudo de base populacional sobre aspectos de acesso, utilização e qualidade da atenção básica em Saúde. Quanto ao censo das condições de infraestrutura das UBS, todas as unidades dos estados do Acre, Rondônia e mesorregiões de Minas Gerais e de São Paulo deverão ser avaliadas em sua totalidade, tanto aquelas localizadas na zona urbana quanto na zona rural.

Objetivo da Pesquisa:

Objetivo Primário:

- Realizar a avaliação externa das equipes de atenção básica no âmbito do PMAQ-AB, de acordo com a Portaria 1.654/19/07/2011;
- Realizar um censo para avaliar as condições de infraestrutura de todas as UBS em funcionamento na totalidade dos municípios brasileiros.
- Induzir a ampliação do acesso e a melhoria da qualidade da atenção básica, com garantia de um padrão de qualidade comparável nacional, regional e localmente de maneira a permitir maior transparência e efetividade das ações governamentais direcionadas à Atenção Básica em Saúde.

Objetivo Secundário:

I - Ampliar o impacto da AB sobre as condições de saúde da população e sobre a satisfação dos seus usuários, por meio de estratégias de facilitação do acesso e melhoria da qualidade dos serviços e ações da AB;

II - Fornecer padrões de boas práticas e organização das UBS que norteiem a melhoria da qualidade da AB;

III - Promover maior conformidade das UBS com os princípios da AB, aumentando a efetividade na melhoria das condições de saúde, na satisfação dos usuários, na qualidade das práticas de saúde e na eficiência e efetividade do sistema de saúde;

IV - Promover a qualidade e inovação na gestão da AB, fortalecendo os processos de Autoavaliação, Monitoramento e Avaliação, Apoio Institucional e Educação Permanente nas três esferas de governo;

V - Melhorar a qualidade da alimentação e uso dos Sistemas de Informação como ferramenta de gestão da AB;

VI - Institucionalizar uma cultura de avaliação da AB no SUS e de gestão com base na indução e acompanhamento de processos e resultados;

VI - Estimular o foco da AB no usuário, promovendo a transparência dos processos de gestão, a participação e controle social e a responsabilidade sanitária dos profissionais e gestores de saúde com a melhoria das condições de saúde e satisfação dos usuários.

Avaliação dos Riscos e Benefícios:

Riscos: Na medida em que os sujeitos da pesquisa participam dando informações de natureza opinativa e não pessoal, sobre as condições de funcionamento da atenção básica, não existe risco previsível nem qualquer constrangimento de ordem pessoal para os participantes. Os participantes responderão às questões, apenas se o desejarem, podendo desistir de participar do estudo em qualquer momento. No relatório técnico da pesquisa, os entrevistados não serão identificados nominalmente.

Benefícios: Esta pesquisa, ao propor avaliar o desempenho da ABS representa uma iniciativa relevante para o Sistema Único de Saúde-SUS e para a população brasileira. Construir um sistema de monitoramento que contemple mecanismo de premiação ao melhor desempenho e apoio técnicocientífico sistêmicos pode estimular a melhoria nas Unidades Básicas de Saúde-UBS/Saúde da Família-SF e criar um ciclo virtuoso de promoção de equidade e cobertura universal em saúde nos territórios dos serviços de saúde.

Comentários e Considerações sobre a Pesquisa:

Os resultados deste estudo poderão ser divulgados através de relatórios técnicos de pesquisa, artigos de revistas e eventos científicos, sem identificação nominal dos sujeitos da pesquisa. Os resultados serão entregues ao Ministério da Saúde para posterior utilização e para subsidiar a tomada de decisões pelos gestores dos três níveis de governo. Os dados serão armazenados eletronicamente, em bases de dados construídas especificamente para a pesquisa, com utilização de tecnologia de informação segura (senhas e demais recursos de informática) e inacessível a pessoas externas à equipe de trabalho.

Justificativa da Emenda: "Submetemos a apreciação do CEP o segundo Ciclo do PMAQ, com novo cronograma e inclusão de novos membros da equipe. Pelo registro apresentado na plataforma as notificações foram aceitas, mas gostaríamos de saber se o primeiro parecer vale para este segundo ciclo, uma vez que não houve alteração do projeto de pesquisa avaliativa".

UNIVERSIDADE FEDERAL DE MINAS GERAIS

Considerações sobre os Termos de apresentação obrigatória:

Presentes:

Folha de rosto

TCLE Representante da Equipe.

TCLE Usuário.

Inclusão de novos membros na equipe.

Instrumento de avaliação externa PMAQ - versão final maio 2012.

Termos de compromisso pesquisadores.

Parecer Câmara Departamental

Pareceres do Colegiado 28801 e 21421.

Pareceres Consubstanciados do CEP 28804 e 22913.

Cronograma Execução Identificação das Etapas.

Resposta parecer 22913.

Brochura Investigador PMAQ Projeto final.

Recomendações:

Recomenda-se acréscimo de campo de datas nos TCLEs, além da informação que o participante não terá nenhuma despesa e não receberá remuneração por sua participação na pesquisa. Este Comitê esclarece que o envio de um relatório parcial da pesquisa deverá ser realizado, pois o cronograma de execução relata a elaboração do relatório final em 30/06/2014. Este relatório parcial deverá conter em linhas gerais o que foi realizado até o presente momento. Inserir também na Plataforma o cronograma de execução do segundo Ciclo do PMAQ atualizado para a próxima etapa. Devido à importância do projeto a emenda será aprovada. Aguardamos as providências sugeridas ao pesquisador.

Gentileza, portanto inserir o cronograma atualizado e enviar, via notificação, os relatórios parciais e final (ao término da pesquisa) pela Plataforma Brasil.

Recomenda-se a aprovação da emenda ao projeto de pesquisa.

Conclusões ou Pendências e Lista de Inadequações:

Somos favoráveis à aprovação da emenda ao projeto "AVALIAÇÃO EXTERNA DAS EQUIPES DA ATENÇÃO BÁSICA NO ÂMBITO DO PROGRAMA NACIONAL DE MELHORIA DO ACESSO E DA QUALIDADE DA ATENÇÃO BÁSICA" do Pesquisador Responsável Prof. Dr. Antonio Thomaz Gonzaga da Matta Machado, com a extensão do prazo da pesquisa por dois anos a partir desta aprovação.

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UNIVERSIDADE FEDERAL DE MINAS GERAIS

Continuação do Parecer: 1.275.911

Considerações Finais a critério do CEP:

Diante do exposto, o Comitê de Ética em Pesquisa da UFMG/ COEP-UFMG, de acordo com as atribuições definidas na Resolução CNS nº 466 de 2012 e na Norma Operacional nº 001 de 2013 do CNS, manifesta-se pela aprovação da emenda proposta ao projeto de pesquisa.

Este parecer foi elaborado baseado nos documentos abaixo relacionados:

Tipo Documento	Arquivo	Postagem	Autor	Situação
Informações Básicas do Projeto	PB_INFORMAÇÕES_BÁSICAS_414407_E1.pdf	30/09/2015 12:04:26		Aceito
Outros	Inclusão de novos membros na equipe.docx	18/03/2014 17:09:08		Aceito
Cronograma	Cronograma_Execução_Identificação das Etapas.pdf	24/09/2013 15:50:00		Aceito
Informações Básicas do Projeto	PB_INFORMAÇÕES_BÁSICAS_DO_PROJETO_23965.pdf	23/05/2012 11:19:42		Aceito
Recurso Anexado pelo Pesquisador	Resposta parecer 22913.pdf	23/05/2012 11:19:04		Aceito
Outros	Instrumento de avaliação externa PMAQ - versão final -maio_2012.pdf	23/05/2012 10:15:06		Aceito
TCLE / Termos de Assentimento / Justificativa de Ausência	TCLE_Final_Representante da Equipe.docx	23/05/2012 10:13:38		Aceito
TCLE / Termos de Assentimento / Justificativa de Ausência	TCLE_Final_Usuário.docx	23/05/2012 10:13:13		Aceito
Informações Básicas do Projeto	PB_INFORMAÇÕES_BÁSICAS_DO_PROJETO_23965.pdf	25/04/2012 11:42:11		Aceito
Outros	Termos_de_compromisso_pesquisadores.pdf	25/04/2012 11:40:40		Aceito
Outros	Parecer Camara Departamental_completo.pdf	25/04/2012 11:20:30		Aceito
Informações Básicas do Projeto	PB_INFORMAÇÕES_BÁSICAS_DO_PROJETO_23965.pdf	23/04/2012 10:16:14		Aceito
Informações Básicas do Projeto	PB_INFORMAÇÕES_BÁSICAS_DO_PROJETO_23965.pdf	13/04/2012 17:09:20		Aceito
Projeto Detalhado / Brochura Investigador	PMAQ Projeto final.doc	13/04/2012 17:00:38		Aceito

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Continuação do Parecer: 1.275.911

Folha de Rosto	Folha de rosto PMAQ.pdf	13/04/2012 16:34:02		Aceito

Situação do Parecer:
Aprovado

Necessita Apreciação da CONEP:
Não

BELO HORIZONTE, 13 de Outubro de 2015

Assinado por:
Telma Campos Medeiros Lorentz
(Coordenador)

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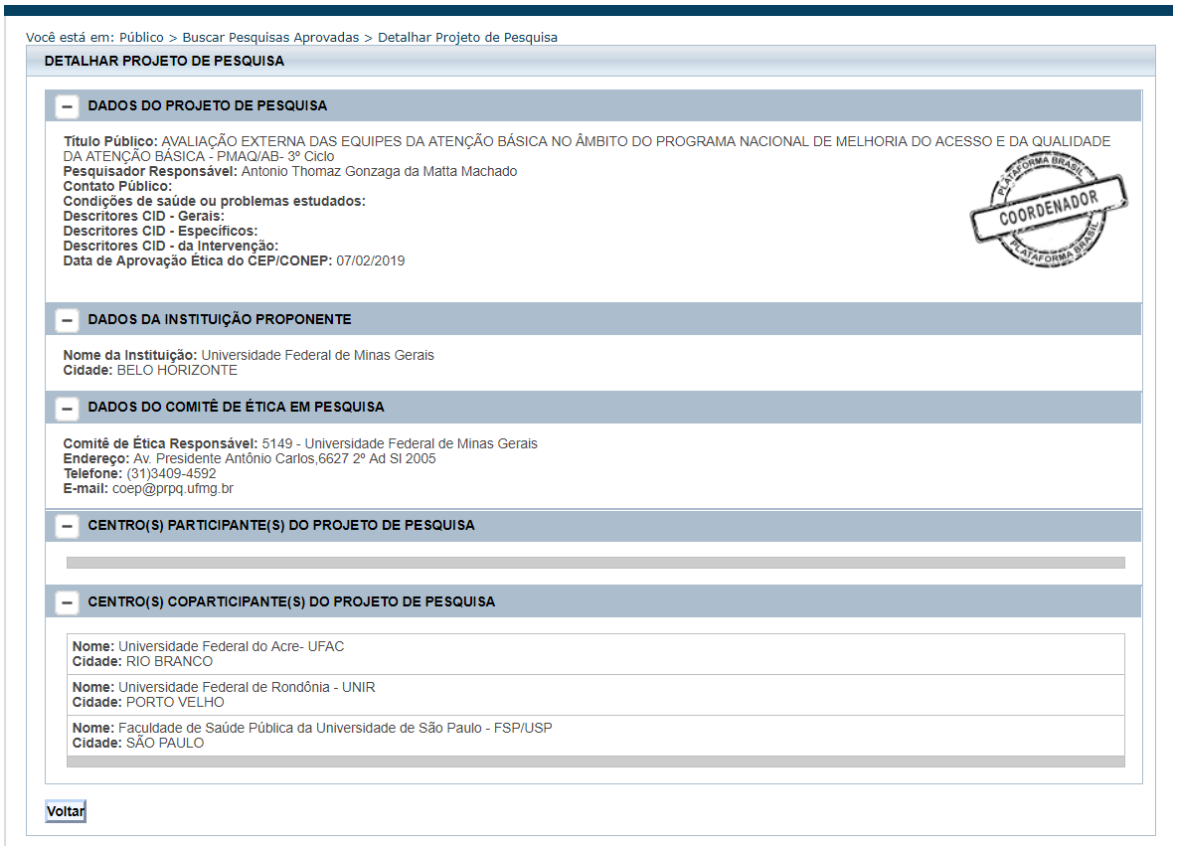
ANEXO C – Comprovante de aprovação no COEP do banco de dados do 3º Ciclo



Você está em: Público > Buscar Pesquisas Aprovadas > Detalhar Projeto de Pesquisa

DETALHAR PROJETO DE PESQUISA

DADOS DO PROJETO DE PESQUISA

Título Público: AVALIAÇÃO EXTERNA DAS EQUIPES DA ATENÇÃO BÁSICA NO ÂMBITO DO PROGRAMA NACIONAL DE MELHORIA DO ACESSO E DA QUALIDADE DA ATENÇÃO BÁSICA - PMAQ/AB- 3º Ciclo
Pesquisador Responsável: Antonio Thomaz Gonzaga da Matta Machado
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Descritores CID - Gerais:
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Data de Aprovação Ética do CEP/CONEP: 07/02/2019

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Voltar

ANEXO D – Normas para publicação na *Medical Care*

Medical Care

Online Submission and Review System

Author Resources

Instructions for Authors (this page)
Copyright Transfer (PDF)
Reprint Ordering
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SCOPE

Medical Care, the official publication of the Medical Care Section of the American Public Health Association, serves as an international medium for publication of worthy articles in the broad field of medical care and thereby encourages progress in the research, planning, organization, financing, provision, and evaluation of health services.

Original contributions are welcomed in the form of both full-length articles and brief reports that describe current developments in the field. Additionally, submission is encouraged of review articles summarizing prior research, manuscripts describing research methods relevant to health services research, and letters to the editor. Selection of manuscripts for publication is based on their timeliness, originality, soundness of methods, significance of findings, appropriateness of conclusions, and quality of presentation. Manuscripts are subject to editorial modification and revisions necessary to bring them into conformity with *Medical Care* style.

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Medical Care requires explicit declaration of any potential conflicts of interest that may exist or have existed for any author for the past three years dating from the month of submission, in accordance with the Center for Science in the Public Interest's "A Common Standard for Conflict of Interest Disclosure," available online at http://cspinet.org/new/pdf/20080711_a_common_standard_for_conflict_of_interest_disclosure_final_for_conference.pdf. As described below, this declaration must be made in the title page and will be published as a footnote on the first page of the manuscript. If no conflict of interest is present, the authors must explicitly state so. Each published manuscript will contain a conflict of interest statement as a footnote on the first page. Although each manuscript will contain an explicit statement

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Each person listed as an author is expected to fulfill the criteria for authorship established by the International Committee of Medical Journal Editors in its statement on Uniform Requirements for Manuscripts Submitted to Biomedical Journals (www.icmje.org).

More specifically, according to the ICMJE, authorship credit should be based on these requirements:

1. Substantial contribution to conception and design, or acquisition of data, or analysis and interpretation of data;
2. Drafting the article or revising it critically for important intellectual content;
3. Final approval of the version to be published; and.
4. Agreement to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

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Manuscripts that do not adhere to the following instructions will be returned to the corresponding author for technical revision before undergoing peer review.

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PATIENT-CENTERED CARE

This section provides a forum for original contributions to the area of patient-centered care. Patient-centered care, as defined by the Institute of Medicine, "entails medical care processes that ensure decisions regarding the care received respect each patient's wants, needs and preferences, and for which the patient has the education and support he or she needs to make

decisions and participate in his or her own care." Original contributions are welcomed in the form of both full-length articles and brief reports that describe current developments in the field, including policies as well as practices. Additionally, submission is encouraged of review articles summarizing prior research, manuscripts describing theoretical concepts or research methods relevant to patient-centered care research, and commentaries.

Manuscripts submitted for the Patient-centered Care section should conform to journal requirements for manuscripts and will be managed like all other manuscripts submitted to the journal. When electronically submitting a Patient-centered Care manuscript through Editorial Manager, the author should choose "Patient-centered Care" as the type of paper being submitted. Selection of manuscripts for publication is based on their relevance, timeliness, originality, soundness of methods, significance of findings, appropriateness of conclusions, and quality of presentation. Manuscripts are subject to editorial modification and revisions necessary to bring them into conformity with *Medical Care* style.

FROM THE STATES

Medical Care invites submissions based on analysis of data from a single state. A unique feature of the United States system of government is the high level of autonomy the Constitution allocates to the states, relative to the federal government. States prize their history, traditions, and unique cultures. For that reason, individual states constitute laboratories for examining social issues and for testing innovations in health care policy and organization. Authors should clearly describe potential relevance to other states (i.e., generalizability) as well as limitations attributable to the unique characteristics of the particular state.

Manuscripts submitted for the From the States section should conform to journal requirements for manuscripts and will be managed like all other manuscripts submitted to the journal. When electronically submitting a From the States manuscript through Editorial Manager, the author should choose "From the States" as the type of paper being submitted. Selection of manuscripts for publication is based on their relevance, timeliness, originality, soundness of methods, significance of findings, appropriateness of conclusions, and quality of presentation. Manuscripts are subject to editorial modification and revisions necessary to bring them into conformity with *Medical Care* style.

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Compared with the traditional editorial process, the Point-Counterpoint approach conveys significant advantages for the presentation of controversial topics. For example, editorials typically place the original work in context, but may not present opposing viewpoints. Letters to the Editor generally focus on specific, and often idiosyncratic, concerns of the author; and rely on the chances of having read the original article. The Point-Counterpoint approach ensures a more global examination of the controversy and more carefully defines the relevant questions. Also, it allows the selection of a respondent with appropriate expertise.

We are herewith soliciting future submissions on topics that are controversial, of interest to readers of Medical Care, and amenable to scholarly and civil discourse. After submission of the original opinion manuscript, the Point, the editors will make arrangements for the Counterpoint piece, to which the original author(s) may also respond. The complete set of manuscripts will be subject to peer review. The suggested format corresponds to that of full-length manuscripts for both the Point and the Counterpoint, with the final reply having the format of a brief report. We look forward to lively contributions to the national discourse on our changing healthcare environment.

STATISTICAL WORKSHOP

The ultimate goal of this section is to improve the quality of health services research reported in the peer-reviewed literature by focusing on common and emerging statistical methods that may be particularly prone to misuse. Note that a concept paragraph should be prepared for in-house review before proceeding with a full submission. The concept paragraph should be sent by email to the journal publisher at karen.doyle@wolterskluwer.com.

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Medical Care will publish suitable Letters to the Editor as space permits. However, there is no guarantee of publication. Letters must not exceed 300 words, excluding references and tables. References are limited to 10 citations. Letters may be subject to editing or abridgment. The Editors will make the determination as to which letters are published. Authors of the article cited in the letter may be invited to reply, and this reply may also be published.

MANUSCRIPT SUBMISSION

All manuscripts must be submitted online through the Journal's electronic submission system via the website at http://www.editorialmanager.com/mdc/.

Style: Pattern manuscript style after the *American Medical Association (AMA) Manual of Style* (10th edition). *Stedman's Medical Dictionary* (27th edition) and *Merriam Webster's Collegiate Dictionary* (10th edition) should be used as standard references. The actual *P*-value should be expressed, rather than expressing a statement of inequality ($P < .05$), unless $P < .001$ (*AMA Manual of Style*, 9th ed., §20.9, Glossary of Statistical Terms, pp 852-900 in print; see *P*-value entry). Refer to drugs and therapeutic agents by their accepted generic or chemical names, and do not abbreviate them. Use code numbers only when a generic name is not yet available. In that case, supply the chemical name and a figure giving the chemical structure of the drug. Capitalize the trade names of drugs and place them in parentheses after the generic names. To comply with trademark law, include the name and location (city and state in USA; city and country outside USA) of the manufacturer of any drug, supply, computer program, or equipment mentioned in the manuscript. Use the metric system to express units of measure and degrees Celsius to express temperatures, and use SI units rather than conventional units. Use numerals; numbers should not be spelled out (not even 1 through 9) except at the beginning of a sentence or where sense requires it. Refrain from using nonstandard acronyms or abbreviations.

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Manuscripts have a maximum of 3,500 words, exclusive of abstract, acknowledgments, figures, tables, and references. Manuscripts are permitted to have a total of 5 figures and/or tables and no more than 50 references. Appendices should be uploaded as supplemental online-only content; see the section on Supplemental Digital Content below for details. Any submissions that exceed these limits will be returned to the authors without peer review. Under very exceptional circumstances, authors may seek permission from the editors to extend the maximum word count to 4,000. When such a request is granted, it should be noted in the cover letter to the editor accompanying the manuscript at time of submission.

Brief Reports are manuscripts that can provide their results clearly in a shorter format; they have a maximum of 2,000 words, again exclusive of abstract, acknowledgments, figures, tables, and references. Other than length, there are no differences in instructions, prestige, or editorial processing between regular length articles and Brief Reports.

Medical Care also publishes occasional manuscripts as part of the Applied Methodology Series. This series is specifically geared toward publishing methods papers for health services and

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The cover letter must contain explicit assurance that each of the listed authors meets each of the authorship requirements as stated in the Uniform Requirements for Manuscripts Submitted to Biomedical Journals (www.icmje.org).

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3. **References:** The authors are responsible for the accuracy of the references. Key the references (double spaced) at the end of the manuscript. At least 6 references and no more than 50 are required or the article will not be accepted for review. Do not use endnotes or footnotes for references. Cite the references in text in the order of appearance. If there are more than 3 authors, name only the first 3 authors and then use et al. Refer to the List of Journals Indexed in Index Medicus for abbreviations of journal names, or access the list at http://www.nlm.nih.gov/tsd/serials/lji.html. See the References section for sample references.

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1. Learn about the publication requirements for Digital Artwork: http://links.lww.com/ES/A42
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- Cite figures consecutively in your manuscript.
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References:

Journal article

1. Mathews WC, McCutchan JA, Asch S, et al. National estimates of HIV related symptom prevalence from the HIV Cost and Services Utilization Study. Med Care 2000;38:750-762.

Book chapter

2. Todd VR. Visual information analysis: frame of reference for visual perception. In: Kramer P, Hinojosa J, eds. Frames of Reference for Pediatric Occupational Therapy. Philadelphia: Lippincott Williams & Wilkins; 1999:205- 256.

Entire book
3. Kassirer JP, Kopelman RI. Learning Clinical Reasoning. Baltimore: Lippincott Williams & Wilkins; 1991.

Software
4. Epi Info [computer program]. Version 6. Atlanta: Centers for Disease Control and Prevention; 1994.

Online journals
5. Friedman SA. Preeclampsia: a review of the role of prostaglandins. Obstet Gynecol [serial online]. January 1988;71:22 -37. Available from: BRS Information Technologies, McLean, VA. Accessed December 15, 1990.

Database
6. CANCERNET PDQ [database online]. Bethesda, MD: National Cancer Institute; 1996. Updated March 29, 1996.

World Wide Web
7. Gostin LO. Drug use and HIV/AIDS [JAMA HIV/AIDS web site]. June 1, 1996. Available at: http://www.ama_assn.org/special/hiv/ethics. Accessed June 26, 1997.

URL (uniform resource locator)
8. (J. M. Kramer, K. Kramer [jmkramer@umich.edu], e mail, March 6, 1996).

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2. Letters to the Editor are a maximum of 300 words and 10 references. Letters to the Editor that exceed these limits will be returned to the author without peer review.
3. Manuscript is typewritten (12-point font) double-spaced, and includes references and figure legends. The manuscript has no headers, footers, endnotes, or footnotes. There is no identifying information about the author(s). A structured abstract (maximum of 250 words) is included and lists its word count at the top of the abstract page.
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ANEXO E – Comprovante de submissão do 2º artigo na *Medical Care*

Gmail Renata Martins <rcmartins05@gmail.com>

Submission has been assigned MDC-D-23-00217
1 mensagem

Medical Care <em@editorialmanager.com> 24 de maio de 2023 às 21:43
Responder a: Medical Care <karen.doyle@wolterskluwer.com>
Para: Renata Castro Martins <rcmartins05@gmail.com>

May 24, 2023

Dear Dr. Martins,

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ANEXO F – Normas para publicação na *Community Dentistry & Oral Epidemiology.*

COMMUNITY DENTISTRY AND ORAL EPIDEMIOLOGY

Author Guidelines

Community Dentistry & Oral Epidemiology now offers Free Format submission for a simplified and streamlined submission process; More details here

Content of Author Guidelines: 1. General, 2. Ethical Guidelines, 3. Submission of Manuscripts, 4. Manuscript Format and Structure, 5. After Acceptance

Useful Websites: Submission Site, Articles published in *Community Dentistry and Oral Epidemiology*, Author Services, Wiley Blackwell's Ethical Guidelines, Guidelines for Figures

1. GENERAL

The aim of *Community Dentistry and Oral Epidemiology* is to serve as a forum for scientifically based information in community dentistry, with the intention of continually expanding the knowledge base in the field. The scope is therefore broad, ranging from original studies in epidemiology, behavioural sciences related to dentistry, and health services research, through to methodological reports in program planning, implementation and evaluation. Reports dealing with people of any age group are welcome.

The journal encourages manuscripts which present methodologically detailed scientific research findings from original data collection or analysis of existing databases. Preference is given to new findings. Confirmation of previous findings can be of value, but the journal seeks to avoid needless repetition. It also encourages thoughtful, provocative commentaries on subjects ranging from research methods to public policies. Purely descriptive reports are not encouraged, and neither are behavioural science reports with only marginal application to dentistry.

Knowledge in any field advances only when research findings and policies are held up to critical scrutiny. To be consistent with that view, the journal encourages scientific debate on a wide range of topics. Responses to research findings and views expressed in the journal are always welcome, whether in the form of a manuscript or a commentary. Prompt publication will be sought for these submissions. Book reviews and short reports from international conferences are also welcome, and publication of conference proceedings can be arranged with the publisher.

Please read the instructions below carefully for details on the submission of manuscripts, and the journal's requirements and standards, as well as information on the procedure after acceptance of a manuscript for publication in *Community Dentistry and Oral Epidemiology*. Authors are encouraged to visit Wiley Blackwell Author Services for further information on the preparation and submission of articles and figures.

2. GUIDELINES FOR RESEARCH REPORTING

Community Dentistry and Oral Epidemiology adheres to the ethical guidelines below for publication and research.

2.1. Authorship and Acknowledgements

Authorship: Authors submitting a manuscript do so on the understanding that the manuscript has been read and approved by all authors, and that all authors agree to the submission of the manuscript to the Journal.

Community Dentistry and Oral Epidemiology adheres to the definition of authorship set up by the International Committee of Medical Journal Editors (ICMJE). According to the ICMJE criteria, authorship should be based on (1) substantial contributions to conception and design of, or acquisition of data or analysis and interpretation of data, (2) drafting the article or revising it critically for important intellectual content and (3) final approval of the version to be published. Authors should meet conditions 1, 2 and 3.

It is a requirement that all authors have been credited as appropriate upon submission of the manuscript. Contributors who do not qualify as authors should instead be mentioned under Acknowledgments.

Acknowledgements: Under *acknowledgements*, please specify contributors to the article other than the authors accredited, along with all sources of financial support for the research.

2.2. Ethical Approvals

In all reports of original studies with humans, authors should specifically state the nature of the ethical review and clearance for the study protocol. Informed consent must be obtained from human participants in research studies. Some reports, such as those dealing with institutionalized children or mentally disabled persons, may need additional details of ethical clearance.

Research participants: research involving human participants will be published only if such research has been conducted in full accordance with ethical principles, including the World Medical Association Declaration of Helsinki (version 2008) and the additional requirements (if any) of the country where the research has been carried out.

Manuscripts must be accompanied by a statement that the research was undertaken with the understanding and written consent of each participant and according to the above mentioned principles.

All studies should include an explicit statement in the Methods section identifying the review and ethics committee approval for each study, if applicable. Editors reserve the right to reject papers if there is doubt as to whether appropriate procedures have been used. Take care to use the term "participant" instead of "subject" when reporting on your study.

Ethics of investigation: Manuscripts not in agreement with the guidelines of the Helsinki Declaration (as revised in 1975) will not be accepted for publication.

Animal Studies: If experimental animals are used, the methods section must clearly indicate that adequate measures were taken to minimize pain or discomfort. Experiments should be carried out in accordance with the Guidelines laid down by the National Institute of Health (NIH) in the USA in respect of the care and use of animals for experimental procedures or with the European Communities Council Directive of 24 November 1986 (86/609/EEC) and in accordance with local laws and regulations.

2.3. Clinical Trials

Clinical trials should be reported using the CONSORT guidelines available at **http://www.consort-statement.org**. A CONSORT checklist should also be included in the submission material.

Community Dentistry and Oral Epidemiology encourages authors submitting manuscripts reporting from a clinical trial to register the trials in any of the following free, public clinical trials registries: www.clinicaltrials.gov, http://clinicaltrials.ifpma.org/clinicaltrials, http://isrctn.org/. The clinical trial registration number and name of the trial register will then be published with the manuscript.

2.4. Observational and Other Studies

Reports on observational studies such as cohort, case-control and cross-sectional studies should be consistent with guidelines such as STROBE. Meta-analysis for systematic reviews should be reported consistent with guidelines such as QUOROM or MOOSE. These guidelines can be accessed at www.equator-network.org. Authors of analytical studies are strongly encouraged to submit a Directed Acyclic Graph as a supplementary file for the reviewers and editors. This serves to outline the rationale for their modelling approach and to ensure that authors consider carefully the analyses that they conduct.

Studies with a health economics focus should be consistent with the Consolidated Health Economic Evaluation Reporting Standards (CHEERS) statement and the CHEERS checklist; see the article at the following link: https://www.bmj.com/content/346/bmj.f1049.

2.5. Appeal of Decision

The decision on a manuscript is final and cannot be appealed.

2.6. Permissions

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Community Dentistry and Oral Epidemiology follows current HIPAA guidelines for the protection of patient/participant privacy. If an individual pictured in a digital image or photograph can be identified, his or her permission is required to publish the image. The corresponding author may submit a letter signed by the patient authorizing the *Community Dentistry and Oral Epidemiology* to publish the image/photo. Alternatively, a form provided by *Community Dentistry and Oral Epidemiology* (available by clicking the "Instructions and Forms" link in Manuscript central) may be downloaded for your use. You can also download the form here. This approval must be received by the Editorial Office prior to final acceptance of the manuscript for publication. Otherwise, the image/photo must be altered such that the individual cannot be identified (black bars over eyes, etc.).

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3. SUBMISSION OF MANUSCRIPTS

New submissions should be made via the Research Exchange submission portal: https://wiley.atyponrex.com/journal/CDOE. Should your manuscript proceed to the revision stage, you will be directed to make your revisions via the same submission portal. You may check the status of your submission at anytime by logging on to submission.wiley.com and clicking the "My Submissions" button. For technical help with the submission system, please review our FAQs or contact submissionhelp@wiley.com.

Community Dentistry and Oral Epidemiology requires the submitting/corresponding author (only) to provide an ORCID iD when submitting their manuscript. If the author does not have an ORCID iD, an easy-to-use application to obtain one is available through the journal's ScholarOne system. Complete instructions for submitting a manuscript are available online and below. Further assistance can be obtained from the Managing Editor, Michelle Martire: cdoejournal@wiley.com

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Data Sharing and Data Availability

Community Dentistry and Oral Epidemiology expects that data supporting the results in the paper will be archived in an appropriate public repository. Authors are required to provide a data availability statement to describe the availability or the absence of shared data. When data have been shared, authors are required to include in their data availability statement a link to the repository they have used, and to cite the data they have shared. Whenever possible the scripts and other artefacts used to generate the analyses presented in the paper should also be publicly archived. If sharing data compromises ethical standards or legal requirements, then authors are not expected to share it.

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3.1. Getting Started

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3.2. Manuscript Files Accepted
Manuscripts should be uploaded as Word (.doc or .docx) or Rich Text Format (.rtf) files (not write-protected), along with separate Figure files. For the latter, GIF, JPEG, PICT or Bitmap files are acceptable for submission, but only high-resolution TIF or EPS files are suitable for printing. Tables should be done in Word rather than in Excel. The files will be automatically converted to HTML and a PDF document on upload, and those will be used for the review process. The text file must contain the entire manuscript, including the title page, abstract, text, references, tables, and figure legends, but no embedded figures. Figure tags should be included in the file. Manuscripts should be formatted as described in the Author Guidelines below.

3.3. Suggest Two Reviewers
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.

3.4. Suspension of Submission Mid-way in the Submission Process
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.

3.5. E-mail Confirmation of Submission
After submission, you will receive an email to confirm receipt of your manuscript. If you do not receive the confirmation email within 10 days, please check your email address carefully in the system. If the email address is correct, please contact your IT department. The error may be caused by some sort of spam filtering on your email server. Also, the emails should get through to you if your IT department adds our email server (uranus.scholarone.com) to their whitelist.

3.6. Review Procedures
All manuscripts (except some commentaries and conference proceedings) are submitted to an initial review by the Editor or Associate Editors. Manuscripts which are not considered relevant to oral epidemiology or the practice of community dentistry or are not of interest to the readership of *Community Dentistry and Oral Epidemiology* will be rejected without review. Manuscripts presenting innovative, hypothesis-driven research with methodologically detailed scientific findings are favoured to move forward to peer review. All manuscripts accepted for peer review 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.

3.7. Manuscript Status
You can access ScholarOne Manuscripts (formerly known as Manuscript Central) any time to check your 'Author Centre' for the status of your manuscript. The Journal will inform you by e-mail once a decision

has been made.

3.8. Submission of Revised Manuscripts
Revised manuscripts must be uploaded within two or three months of authors being notified of a Minor or Major revision decision respectively. Locate your manuscript under 'Manuscripts with Decisions' and click on 'Submit a Revision' to submit your revised manuscript. Please remember to delete any previously-uploaded files when you upload your revised manuscript. Revised manuscripts must show changes to the text in either a coloured font or highlighted text. Do NOT use track changes for this. Prepare and submit a separate "Response to reviewers" document, in which you address EACH of the points raised by the reviewers.

3.9. Conflict of Interest
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.

3.10. Editorial Board Submissions
Manuscripts authored or co-authored by the Editor-in-Chief or by members of the Editorial Board are evaluated using the same criteria determined for all other submitted manuscripts. The process is handled confidentially and measures are taken to avoid real or reasonably perceived conflicts of interest.

4. MANUSCRIPT FORMAT AND STRUCTURE

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Before you submit, you will need:

- Your manuscript: this should be an editable file including text, figures, and tables, or separate files – whichever you prefer. All required sections should be contained in your manuscript, including abstract, introduction, methods, results, and conclusions. Figures and tables should have legends. Figures should be uploaded in the highest resolution possible. References may be submitted in any style or format, as long as it is consistent throughout the manuscript. Supporting information should be submitted in separate files. If the manuscript, figures or tables are difficult for you to read, they will also be difficult for the editors and reviewers, and the editorial office will send it back to you for revision. Your manuscript may also be sent back to you for revision if the quality of English language is poor.
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If you are invited to revise your manuscript after peer review, the journal will also request the revised manuscript to be formatted according to journal requirements as described below.

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Manuscripts can be uploaded either as a single document (containing the main text, tables and figures), or with figures and tables provided as separate files. Should your manuscript reach revision stage, figures and tables must be provided as separate files. The main manuscript file can be submitted in Microsoft Word (.doc or .docx) format.

Your main document file should include:

- A short informative title containing the major key words. The title should not contain abbreviations
- The full names of the authors with institutional affiliations where the work was conducted, with a footnote for the author's present address if different from where the work was conducted
- Acknowledgments
- Abstract
- Up to seven keywords
- Main body
- References
- Tables (each table complete with title and footnotes)
- Figures: Figure legends must be added beneath each individual image during upload AND as a complete list in the text

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 (including references) 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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4.2. Format Language
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

All manuscripts submitted to *Community Dentistry and Oral Epidemiology* should follow the structure guidelines below.

Title Page: the names and institutional affiliations of all authors of the manuscript should be included.

Abstract: All manuscripts submitted to *Community Dentistry and Oral Epidemiology* should use a structured abstract under the headings: Objectives – Methods – Results – Conclusions.

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'.

4.4. References

Authors are required to cite all necessary references for the research background, methods and issues discussed. Primary sources should be cited. Relevant references published in CDOE are expected to be among the cited literature.

The list of references begins on a fresh page in the manuscript. All references should be numbered consecutively in order of appearance and should be as complete as possible. In text citations should cite references in consecutive order using Arabic superscript numerals. Sample references follow:

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

4.5. Tables, Figures and Figure Legends

Tables are part of the text and should be included, one per page, after the References. Please see our Guide to Tables and Figures for guidance on how to lay these out. All graphs, drawings, and photographs are considered figures and should be sequentially numbered with Arabic numerals. Each figure must be on a separate page and each must have a caption. All captions, with necessary references, should be typed together on a separate page and numbered clearly (Fig.1, Fig. 2, etc.).

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.

Further information can be obtained at Wiley Blackwell's guidelines for figures:
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Check your electronic artwork before submitting it:
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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.

5. AFTER ACCEPTANCE

Upon acceptance of a manuscript for publication, the manuscript will be forwarded to the Production Editor, who is responsible for the production of the journal.

5.1. Proof Corrections

The corresponding author will receive an email alert containing a link to a web site. A working email address must therefore be provided for the corresponding author. The proof can be downloaded as a PDF (portable document format) file from this site.

Acrobat Reader will be required in order to read this file. This software can be downloaded (free of charge) from the following Web site: www.adobe.com/products/acrobat/readstep2.html. This will enable the file to be opened, read on screen, and printed out in order for any corrections to be added. Further instructions will be sent with the proof. Hard copy proofs will be posted if no e- mail address is available; in your absence, please arrange for a colleague to access your e-mail to retrieve the proofs. Proofs must be returned within three days of receipt.

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