

1 Dental emergency: scoping review

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3 Karla Frichembruder¹, Camila Mello dos Santos^{1,2}, Fernando Neves Hugo³

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5 ¹ Center of Social Dentistry Research, Federal University of Rio Grande do Sul,
6 Porto Alegre, Rio Grande do Sul, Brazil

7 ² Graduate Program in Collective Health, Federal University of Rio Grande do
8 Sul, Porto Alegre, Rio Grande do Sul, Brazil

9 ³ Graduate Program in Dentistry, Federal University of Rio Grande do Sul, Porto
10 Alegre, RS, Brazil

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15 Corresponding author

16 E-mail: karla.frichembruder@ufrgs.br (KF)

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20 ¶¶These authors contributed equally to this work.

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31 **Abstract**

32 Part of the oral health care in the care network encompasses users in
33 cases of emergency. This study proposed to map the determinants of the use of
34 dental care services within the health care network to address dental
35 emergencies of the Brazilian Unified Health System (UHS) and to verify the
36 main gaps in the research in this area. This is a scoping review that took place
37 in 2018 using Andersen's behavioral model as a reference. A total of 16 studies,
38 out of 3786 original articles identified, were included and reviewed. Two
39 reviewers independently conducted the selection process and the decision was
40 consensually taken. The mapping of the determinants revealed a greater
41 number of enabling factors and a larger gap in results. Greater use of the
42 emergency service was registered by people in pain, women, adults, from an
43 urban area, with a lower income, and less education. In future studies, primary
44 surveys are recommended, which include all ages, analyzing different groups of
45 needs and users that take into account the country's northern region and the
46 different subjects pointed out in this review.

47 Keywords: emergencies, oral health, health services, health care

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56 **Introduction**

57 The majority of oral diseases is chronic and share several determinants
58 with other chronic non-transmissible diseases. Among the different oral
59 diseases, untreated dental caries registers the most prevalent, affecting almost
60 half of the world population, with a negative impact on the quality of life. The
61 pain caused by untreated dental caries affects the quality of sleep and the
62 ability to eat, it slows growth and negatively affects social life[1,2].

63 Since 1988, Brazil's Unified Health System (UHS) is attempting to build a
64 humanized care model, centered on the patient, and has been coordinating
65 services and shaping actions for the promotion, prevention and care in Primary
66 Health Care (PHC) through the Family Health Strategy, but has also been
67 reorganizing other points of the care networks. The network conformation has
68 the intent to address the multiple health care challenges in a fragmented system
69 primarily oriented by acute conditions. Availability, access, and the ability to
70 quickly transition between health care providers are the defining elements of a
71 good or otherwise unsatisfactory network interface[3].

72 The expansion of oral health care in Brazil since the establishment of the
73 UHS is undeniable, with the organization of priority programmatic actions, such
74 as the expansion of primary care, specialized dental care and support services,
75 care provided to pregnant women and children, and emergency services[4]. The
76 guarantee of care provided to patients in acute conditions in public services is
77 an ethical principle found in the guidelines of the National Policies of
78 Humanization, Primary Care, Oral Health and Emergency Care (National Policy
79 of Emergency Attention – NPEA)[5–8]. The network structure of emergency
80 care with settled flows intends to address acute cases according to their risk

81 rating in order to provide care locally and in the appropriate time in each
82 case[9]. It is expected that most cases of dental emergencies will be treated in
83 the PHC or Secondary Emergency Care, being the focus of hospital care the
84 cases with greater risk of life. After emergency care, the patient is expected to
85 be referred for continuity of care at one of the scheduled care points. It is
86 recommended that scheduled specialized dental care be performed exclusively
87 by reference. During the previous decade, there was an increase in this point of
88 care through the induction of implantation of dental specialty centers (DSC).

89 The monitoring of the development of the care network encompasses
90 several elements, such as the operationalization of the governance system,
91 population characteristics, operational structure and model of care. In turn, the
92 monitoring of the use of network services requires the extension of the scope of
93 analysis, since the use is shaped by the *“interaction of behaviors of individuals
94 and professionals that lead them through the health system”*[10]. The mapping
95 of determinants of the use of dental emergency services as part of the UHS is
96 decisive for the analysis of the situation, for the planning of actions of
97 intervention aimed at improving access and quality of care, and represents a
98 research gap.

99 In order to understand the different factors which may influence the use
100 of network health services by users in dental emergency, this study aims to map
101 the determinants of use of the emergency care network (ECN) of the UHS and
102 verify the main research gaps. The scoping review in the Brazilian context is
103 justified by the influence of the organizational model on the use of services.

104 **Material and methods**

105 Scoping reviews are a sort of knowledge synthesis which systematically
106 maps evidence on a specific subject matter, identifying key concepts, theories,
107 sources of evidence, and research[11]. This scoping review follows the five
108 steps proposed by Ashley and O'Malley[12]: (1) identifying the research
109 question, (2) identifying relevant studies, (3) selecting studies, (4) collecting
110 data, (5) mapping, summarizing and describing the results[12].

111 **Theoretical model**

112 Understand how the use of services in the network occurs and how the
113 factors of the behavioral model modulate the access to health services.. It
114 means obtaining proper care at the right time and place to promote better health
115 outcomes. This model is intricate and multidimensional and has been improved
116 over the years. The model bases itself on the fact that improved access to care
117 is more properly addressed and explained through the relationship between
118 predisposing, enabling, need, health behaviors and outcomes and considering
119 contextual and individual factors[13].

120 **Research question**

121 The topic of interest was dental emergencies and the research question
122 was the following: what has been studied on the use of dental emergency care
123 network in Brazil's UHS public services? The question encompasses the
124 concept of emergency in dentistry, user-related factors, as well as the
125 organization of the ECN, its components and organizational principles. The

126 preestablished criterion of inclusion was to be an article on the subject of dental
127 emergency care in the context of Brazilian public services.

128 **Research and study selection**

129 In order to build the research strategies, an adapted version of the PECO
130 strategy was adopted (P: patient, E: exposure, C: comparison, O: outcomes),
131 turning into PEC, in which “P” means the population (users), “E” means
132 exposure of interest (dental emergency), “C” means the context (health
133 services)[14].

134 The health descriptors and the combinations used to build the strategies
135 were the following: “emergencies”, “emergency”, “oral health”, “dentistry” and
136 “health services” with Boolean operators such as “AND” and “OR”. The search
137 was carried out in the Medline (PubMed), Embase and Web of Science
138 databases from their beginning until September 2018. The descriptors
139 summarized in Medline were: (((((((((((((emergencies OR emergenc*) OR
140 urgenc*)) OR ((out of hours) OR out-of-hours))) AND (("oral health" OR dent*))
141 AND (((((((((((health services OR public health dentistry]) OR after-hours care OR
142 "dental care") OR emergenc* dental service) OR emergenc* dental care) OR
143 "oral care") OR "dental services"))))))))))); in Embase: ('out-of-hours' OR 'out of
144 hours' OR 'emergen*' OR 'urgen*') AND ('oral health' OR 'dental') AND
145 ('emergency health service' OR 'out-of-hours care' OR 'emergency care' OR
146 'emergency care'); and in Web of Science: (((emergencies/ OR “urgen*dental”
147 OR “emergen* dental”) OR (“out-of-hours” OR “out of hours” OR
148 “unscheduled”)) AND (dental care/ OR dental health services/ OR “dental care”
149 OR “dental service*” OR “public health dentistry” OR “dental after-hours care ”)).

150 Also, the search was conducted in the gray literature using the “Google Scholar”
151 search engine.

152 Titles and abstracts were read and analyzed in order to identify those
153 potentially eligible for the study. The selected studies were fully read by two
154 independent reviewers to confirm the relevance when taking into consideration
155 the review question and, when relevant, to extract the data deemed interesting.

156 After the completion of the search and analysis processes, the following
157 exclusion criteria were established: published before 1990, having as a
158 referencing point the fact that such was the year of enactment of Law 8080,
159 which rules on the organization of health services, abstracts and articles
160 published as part of meetings and studies in hospitals.

161 **Data collection, summarization and presentation of results**

162 The data extracted were: author, year of publication, journal, emergency
163 concept, objectives, methodology (setting, design, population/sample, duration,
164 outcome and exploratory variables) and results. The data was organized into
165 Excel spreadsheets. The studies were classified according to the Emergency
166 Care Network in: PHC, DEC and ECN. The term DEC was used to take into
167 consideration different terminologies found for specialized dental emergency
168 services, in turn the term ECN was used to identify studies involving both points
169 of the emergency network. DEC are intermediary services that exclusively
170 attend emergencies, supporting this service in the PHC and reducing the
171 hospitalization of dental urgency in the hospital, which should refer care to the
172 PHC, DSC, or hospitals according to the needs of the people. It includes dental
173 care in emergency medical services that can be qualified for 24-hour care,
174 offering beds for short-term prehospital care, in this case, receiving its own

175 financing according to the fulfillment of pre-established goals. The studies were
176 grouped according to the age variable of the participants, studies with
177 participants aged 20 years or more were grouped in adults and old adults. The
178 results were categorized according to the components of behavioral model ,
179 similar to the methodology used by Worsley et al., that evaluated access to
180 dental emergency services[15]. Among enabling factors were the specific
181 aspects of the Brazilian model, which are related to organization and financing
182 that have an influence on the universal and comprehensive access to care in
183 the network. From this standpoint, the variables of the studies that attempted to
184 assess the perception and agreement of the professionals and
185 managers/coordinators about the service were distributed considering the
186 professionals and managers, and kept as capacitors, since they were
187 understood as the evidence of the service organization, in the meantime, as
188 observed by Worsley, there was the possibility to include them in other fields of
189 the model. Therefore, 5, 8 and 20 variables were grouped as interface between
190 PHC and DEC (health care network design, levels of health care,
191 comprehensiveness, integration-interdependence-communication, streams of
192 care), perspective of professionals (type of oral conditions attended ,
193 treatments, reference to hospitals, knowledge required for action, service
194 orders, completion of treatment, more frequent type of urgency, reception and
195 risk classification, work overload, clinical and pharmacological guidelines,
196 referral system, continuing education, resources, patient profile, patient
197 admission form, continuity of care, medical records, gratuities, time and
198 attendance monitoring and managerial meetings), perspective of managers
199 (waiting time, structural conditions, patients' admission form, professional

200 satisfaction, social control, production goals, patient satisfaction, reference
201 system), respectively. In health behavior, the use of dental floss and tooth
202 brushing were grouped into oral hygiene. In use of personal health services, 14
203 variables were arranged together as use due to dental emergency (difficulty in
204 accessing dental care, emergency care as first choice to access PHC, annual
205 trend of care at DEC, emergency service as first access to dental care, PHC or
206 DEC as first choice to dental emergency care, return to the dental emergency
207 service for the same problem, comparison of type of dental emergency care in
208 different services, time since last dental appointment, unresolved complaints
209 and abandonment).

210 **Ethical Considerations**

211 This study relied on secondary data analysis, available in database of
212 scientific literature and, therefore, it did not require submission to the Research
213 Ethics Committee.

214 **Results**

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216 The study encompassed a total of 3786 articles after the removal of
217 duplicates and, of these, 16 studies were included. The flowchart for the
218 selection of publications is presented in figure1.

219 Fig 1. Scoping review flowchart

220 The time needed to carry out the study, from the research project to the
221 completion of the article, was of approximately five months.

222 **Studies description**

223 Of the 16 studies included, four (25%) were part of the PHC, ten (62.5%)
224 of the DEC, and two (12.5%) involved the ECN. No publications were found
225 from the country's Northern region, publications on DEC are distributed among
226 services located in the other 4 regions of the country, articles related to PHC
227 come solely from services located in the South and Southeast regions, while
228 publications involving the ECN come from South and Northeast regions.

229 Among the primary studies, fifteen were quantitative (93.8%), among
230 them 8 (53.4%) were descriptive and 7 (46.7%) cross-sectional, the data were
231 secondary in 9 (60%), the remaining used questionnaires. Of the 15 quantitative
232 studies, 10 (62.5%) had the individual as the unit of analysis.

233 **Emergency concept**

234 Four articles (25%) presented three concepts on emergency, "Urgency
235 is any immediate treatment that alleviates the patient's discomfort who is not at
236 risk, while emergencies are serious occurrences, in which the patient requires
237 quick care, since there is a risk of life involved"[16], "a dental emergency is
238 associated with immediate measures whose target is to alleviate the painful,
239 infectious and/or aesthetic symptoms of the oral cavity"[17,18].and "the dental
240 emergency service can be defined as the care provided to patients with oral
241 issues that interfere with their lives or organ functioning"[19].

242 **Behavioral model for the use of health services**

243 The mapping of determining factors on the use of services, according to
244 the included studies, is shown in figure 2.

245 Fig 2. Determinant factors in use of dental emergency services

246 Among the 146 occurrences of determining factors, the enabling factors
247 were the most frequent (34.2%) and the outcome category was the least
248 studied (2%). The research gaps are shown in figure 3.

249 Fig 3. Gaps in dental emergency research

250 **Predisposing factors and gaps**

251 Among the predisposing factors, gender and age were the variables that
252 appeared most frequently in the studies. The female gender was the most
253 frequent (6/10, 60%)[16–25]. The studies that included all ages or those above
254 13 years old (n=7/9, 63%) pointed adults as the most prevalent, in turn, in
255 studies up to 19 years (n=3), the highest frequency was found between 10 and
256 14 years[16–25]. The comparative study indicated a higher prevalence of DEC
257 use by teenagers in comparison to children[21]. The proportionality between
258 gender and age and the population without emergent needs, or the ascribed or
259 reference population, was not addressed.

260 A low number of studies used the variables origin, ethnicity and health
261 predispositions. An inverse relationship between education and emergency use
262 was seen in both points of the network (3/4, 75%)[17,20,24], one study refers to
263 this inversion through maternal education[20]. In PHC and DEC, there was
264 greater use by married individuals, the majority of which employed or
265 autonomous (n=2)^{20,23}. In PHC, an average of two children was found, as well
266 as double or triple shift jobs (n=1)[20]. In DEC, the majority of those attended
267 originated from the service's coverage area (n=1), there is a higher chance of
268 use by people from neighborhoods deemed as having greater social exclusion
269 rate (n=1)[24] and rural residents accessed it less often (n=2)[16,25]. In the
270 contextual analysis of the PHC, the group of services with the greatest ratio of

271 dental emergency was not the one whose area was the most vulnerable to
272 health (n=1)[26]. The health predispositions described the fear of going to the
273 dentist (n=1)[20], depression (n=1)[20], allergies (n=2)^{19,28} and systemic health
274 conditions, with hypertension being the most frequent (n=1)[17]. There were
275 several research gaps addressing beliefs, knowledgeability about the service,
276 trauma-related issues and studies conducted in specific groups such as
277 disabled and older adults.

278 **Enabling factors and gaps**

279 There was a declining ratio between the income of users and the use of
280 emergency services at both points of the network (n=2)[20,24]. A study
281 conducted in the DEC reported that most users do not have health insurance
282 and travel by bus to the emergency[24]. When analyzing the expansion of the
283 oral health team (OHT) in the PHC network over a three-year period, one study
284 noticed that, in relation to the total number of appointments, there was a
285 statistically significant reduction during the studied period that was justified by
286 the year of greatest expansion. Nevertheless, the monthly variation was high
287 and, although there was a reduction in the total number of emergency visits, in
288 the vast majority of the months studied, the target of less than 20% of the total
289 number of appointments was not reached[27]. In the ecological study, the
290 differences between the group of services with the highest ratio of emergency
291 and preventive procedures could not be explained by the population coverage
292 provided by the family health team and the ESB[26].

293 Information on health policy, funding and organization of the ECN and
294 the DEC is limited to a scarce number of studies with high variability in the
295 variables gathered, but their results converge to deficiencies in the organization

296 of the ECN. One study points out that most managers are unaware of policy
297 updates, others barely engage in financial planning and execution[28,29]. It was
298 reported that most managers are unaware of objectives, they acknowledge
299 access to the DEC by free demand, there is no waiting time science, nor one
300 regarding the level of user satisfaction, but that there is a record of criticism and
301 suggestions provided by the user and they say they take into account the
302 professional satisfaction and user suggestions, while most do not engage in the
303 Municipal Health Council (n=1)[28]. The managers guaranteed the presence of
304 at least one equipment ready to be used, having been subjected to preventive
305 maintenance (n=1)[28]. There is evidence of acknowledgment of the role of
306 each of the points among network professionals (n=1)[29], but without any
307 communication, protocols and reference flows (n=2)[28,30], with poor
308 recognition of lines streams of care in the DEC (n=1). Studies conducted in the
309 DEC reported diverging opinions among professionals about some activities to
310 be performed, procedures and which to refer[30,31], while there is consensus
311 on spontaneous demand access and on the use of the medical record, science
312 dedicated to accommodation failures and the system of risk rating, referencing,
313 continuing education and protocol with clinical and pharmacological guidelines,
314 and failures in infrastructure resources. Also, professionals confirm the control
315 of workload and additional workload for the night shift[30,31]. The profile of the
316 emergency user outlined by the professional confirms the predisposing
317 characteristics and needs obtained in this review, the majority affirms that the
318 user does not have a referral document, but affirms that they guide their own
319 search under the continuity of care[28]. Most professionals acknowledge the
320 highest contributions to their practice in graduation and in-service experience

321 (n=1)[30]. There are indications for research on the effect of the NPEA on the
322 ECN development, changes in access after organizational changes in the care
323 network, related to health economics and related to the user.

324 **Health needs factors and gaps**

325 The need perceived by the majority of users that led them to use the
326 services was pain (n=7)[16–18,20,22,24,25]. One study showed that post-
327 traumatic injury complaints were more frequent in men and there was a
328 noteworthy difference by age group, in which the highest prevalence of trauma
329 and post-traumatic injuries was 0 to 5 years[22]. A share of DEC users
330 acknowledges that they do not have an emergency need (n=1)[24]. The
331 comparative study mentioned emergency as the reason for the first access to
332 oral health for a portion of the population up to 17 years old, in which
333 adolescents are more prone to entry via DEC[21]. The gaps identified are
334 related to the use of subjective and social indicators, the agreement between
335 professionals and managers and analysis of environmental contexts.

336 **Health behavior factors and gaps**

337 The health practices described were oral hygiene (n=1)[17], self-
338 medication ((n=2)[16,25], smoking (n=2)[17,20] and alcoholism (n=1)[17]. The
339 majority of medical records did not contain information on self-medication,
340 among which they reported low use, with analgesics being the most frequent. A
341 study in the PHC described that most users did not experience difficulties in
342 accessing and had already used the service for emergency-related matters, and
343 the time between the perception of the need and the use of the service was
344 seven days[20]. In the DEC, one study reported that the ratio of people

345 attended in the estimated population did not differ over a three-year period[24],
346 another study affirmed that just under a third of those attended declared they
347 failed to access the PHC due to infrastructure issues, the lack of openings or
348 the absence of the medical specialty required[23], for the majority the time from
349 the onset of symptoms to the use of care services was two days[24]. A small
350 ratio is found in dental care, most of them use the UBS or health insurance[18].
351 The results regarding greater demand for the service depending on the shift,
352 day and month were divergent (n=4)[16,22,23,25], but there seems to be a
353 relationship between the shifts used and the age group, where older people
354 tend to use them in the morning, children in the afternoon and teenagers and
355 young adults at night. The share of people who use the DEC and were not
356 attended was similar in the three studies, with less than 3%[16,22,25]. The
357 comparative study found that the prevalence of first access to the system
358 through the emergency via DEC was significantly higher in adolescents than in
359 children, the majority of participants has spent more than one year without any
360 dental appointment and a minority has used the service previously as a matter
361 of emergency[21]. In relation to treatment, restoration and extraction are the
362 most frequent procedures (n=3)[18,19,23]. From the contextual standpoint, in
363 the PHC, the probability of being part of the group of services with the highest
364 emergency ratio was associated with having the treatment completed for more
365 than 3 teeth with cavities or indication of tooth extraction[22]. Regarding the
366 problem-solving abilities in the DEC, one article pointed out that most of the
367 complaints were solved and another reported that the majority of the
368 treatments were not fully operative[16,18]. A study conducted in the DEC
369 pointed out that the majority of those attended do not need to be referenced for

370 programed care in specialized services[16]. No publications were found on the
371 use and adherence to treatment or referral protocols, nor about needs related to
372 continuing education or discussion of care from the ethical standpoint.

373 **Outcome factors and gaps**

374 As for the outcome component, a publication presented the perception of
375 the users regarding the DEC service. Facilities, information, cleaning and
376 signage, waiting time and care provided by the ESB were assessed as good,
377 with room for improvement, particularly in waiting time and care provided[24].
378 No studies were found that assessed the perception of post-care health and
379 quality of life.

380 **Discussion**

381

382 The mapping of the determining factors of the use of emergency services
383 provided an overview of the evidence, the reflection on variables to be included
384 in future studies and a wide array of research topics which may lead to a better
385 understanding of the determinants of use of emergency dental services. There
386 is a short number of studies involving the ECN and the PHC, and there are
387 research gaps in the Northern region of Brazil. There were a considerable
388 number of descriptive studies, variability between the categories studied and
389 diversity of exploratory variables that make comparisons more difficult, but they
390 nonetheless extend the perspective on the subject matter.

391 The concepts found are related to the perceived need and to the
392 organization of care, since they refer to care or service, they include the notion
393 of time and relief of symptoms, illness and issues that interfere with the life of
394 the user. The concept of life-threatening is the differentiator and promptly

395 indicates the need for immediate care in tertiary care. Nevertheless, there is a
396 scarce number of publications that conduct conceptual reflections on dental
397 emergency. The presence of some level of disagreement regarding the
398 activities, procedures and reference found in the DEC does not seem to reflect
399 the conceptual range of emergency care and suggests the presence of tensions
400 in the team that may constitute barriers to access and indicate the need for
401 improvement in the work[32].

402 The absence of some elements emphasized in the model can be partially
403 explained by the restriction of data information from the Brazilian information
404 system. Notwithstanding, the results found are in line with those of a systematic
405 review of inequity in access in oral health services which, in South America, has
406 revealed that the opportunities of access are lower for men, ethnic minorities,
407 rural inhabitants and distinguishes itself for the access by a lower educational
408 level and income, since, in the emergency service, the individuals with lower
409 educational level, lower income and diminished access to health plans were the
410 ones that accessed it the most[33].

411 The international literature provides several that separate studies on
412 traumatic from non-traumatic dental emergencies[34–37], but not a single
413 Brazilian studied used this division, probably because of the differences
414 between the organization of health services, since a large share of these
415 articles refer to care in outpatient clinics and some involve care provided by a
416 medical professional. Nonetheless, there was an analysis of traumatic events
417 that corroborated the greater frequency of trauma in men and younger boys[38].
418 The prevention of trauma is difficult, the approach varies, since the cause is
419 related to risk factors according to age, accidents, sports and violence[38]. For

420 instance, studies involving day-care centers and public schools show the low
421 level of knowledge on dental trauma cases, evidencing a research gap in
422 relation to the PHC[39,40]. There were no studies on anxiety in the ECN, two
423 studies in Dental School services reveal that an important portion of those seen
424 in their emergency services has a high degree of anxiety, which is higher in
425 women and is related to previous traumatic events[41,42].

426 The limitations of this scoping review are the exclusion of abstracts from
427 events and theses, dissertations and monographs, which may have caused the
428 omission of some relevant study. The high variability among the studied age
429 groups in the DEC can be a confounding factor.

430 Studies on the care network and the integration of the PHC with the
431 Dental Specialties Centers (DSC) presented some results similar to those in the
432 PHC and DEC, such as failures in continuing education and reduced
433 engagement in participation forums and, although there are also weaknesses
434 identified in services and in the interface, they seem to register better results
435 when it comes to the identification of objectives, presence of protocols and
436 reference flows[43,44]. The policies that involve secondary care in the care
437 network, the DSC and the DEC are recent, but they have occupied different
438 positions, since, even though both are based on the National Oral Health Policy,
439 the regulations of the DEC services are associated with the NPEA, whose
440 priority is not dental care[7,45,46]. The difference between having specific
441 financial incentive rules, implementation, monitoring and assessment, as well as
442 the involvement different sectors in the planning, training and monitoring of the
443 DSC, may serve as an explanation for the better results in comparison to when
444 these are related to a broader policy.

445 **Conclusion**

446

447 To improve access and the quality of oral health care in Brazil, it is
448 important to identify the determinants of the use of emergency dental services.
449 The results converge to accumulated needs related to the aggravation of
450 chronic oral diseases with painful symptomatology in users who are subjected
451 to worse socioeconomic conditions and they appear to differ from the
452 determinants of use by programmed demand. There is an evident need for
453 improvement in each of point of the ECN and in its interface, such as
454 improvements in accommodation, assimilation of risk rating, definitions of
455 protocols and reference flows, which require the involvement of professionals
456 and managers in every network sector. This review also contributes to the
457 reflection on variables, subject matters and research designs that must be taken
458 into account in the planning of new studies, since there is a need for further
459 research efforts on the performance of services and the care network and
460 effectiveness of this sort of care in dental emergencies.

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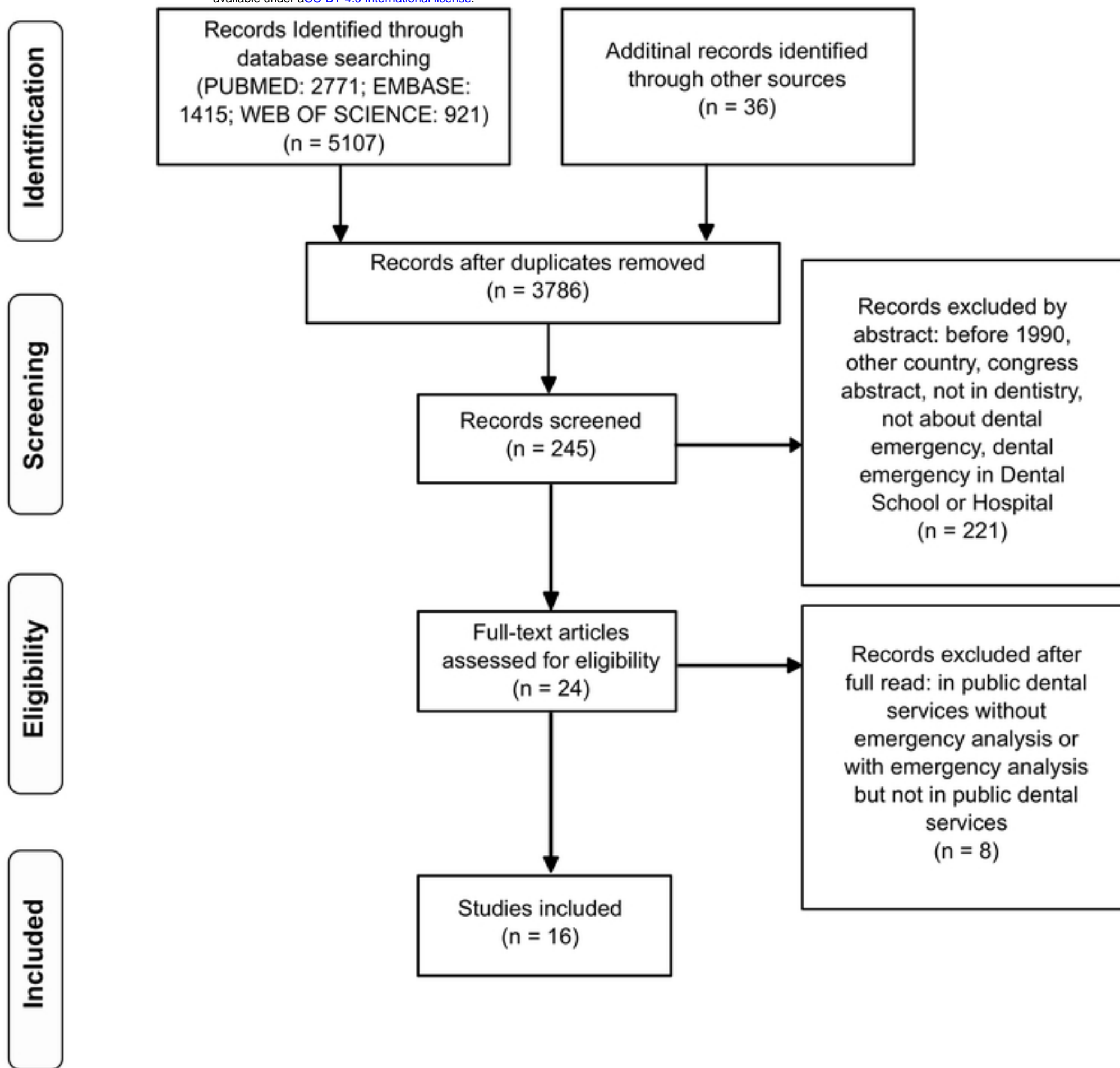
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620 **Supporting Information**

- 621 S1. Fig 1. Scoping review flowchart
- 622 S2. Fig 2. Determinant factors in use of dental emergency services
- 623 S3. Fig 3. Gaps in dental emergency research
- 624 S4. Fig 4. Prisma Checklist Scoping Review



Figure

Predisposing (40)	Enabling (50)	Needs (14)	Health behaviors (39)	Outcomes (3)
Demographic	Health policy	Perceived	Personal health practices	Consumer satisfaction
Age (10) [16-25]	Knowledge about municipal policy and DEC re-organization strategy (2) [28,29]	Complaint (7) [16-18,20,22,24-25]	Oral hygiene (2) [17]	Infrastructure (1) [24]
Gender (10) [16-25]	Interface between PHC and DEC (5) [29]	Perception of absence of need (1) [24]	Self-medication (2) [16,25]	Waiting time (1) [24]
Social	Financing	Evaluated	Alcohol consumption (1) [17]	OHT (1) [24]
Occupation (2) [20,17]	Public resource management (1) [28]	Risk rating (2) [16,25]	Smoking (2) [17,20]	
Education (3) [17,20,24]	Income (2) [20,24]	Diagnosis of oral disease (3) [17,20,26]	Use of personal health services	
Maternal education (1) [20]	Health plan (1) [24]	No dental emergency need (1) [22]	Due to dental emergency (14) [16,18,20-25]	
Marital status (2) [20,24]	Vehicle (1) [24]		Day or shift (4) [16,22,23,25]	
Number of children (1) [20]	Organization		Month (2) [22,25]	
Index of vulnerability (1) [26]	Expansion of the PHC (1) [27]		In elective care (1) [18]	
From urban/rural area (2) [16,25]	Goal to dental emergency (1) [27]		Process of medical care	
From area of coverage by DEC or not (1) [22]	Coverage by PHC (2) [26,27]		Treatment completed (2) [17,26]	
From area of social exclusion or not (1) [23]	Coverage by OHT (2) [23,26]		Type of treatment (3) [18,19,23]	
Ethnicity (1) [24]	DEC availability in administrative region (1) [21]		Problem-solving (3) [16,18,24]	
Predisposing conditions	Distance from PHC service and DEC (1) [21]		Reference in the HCN (2) [16,26]	
Fear (1) [20]	Perspective of professionals about DEC (22) [28,30,31]			
Health conditions (4) [16,17,20,25]	Perspective of managers about DEC (8) [28]			

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Predisposing	Enabling	Needs	Health Behaviors	Outcomes
Aspects related to violence and accidents and dental emergency.	NPEA impact on the access	Assessment according to subjective and social indicators of oral health	Adherence to the treatment protocol	User satisfaction
On oral health and dental care	Economic studies on health and access to emergency dental services	Agreement between professionals and users	Ethics in dental emergency	Impact of dental emergency on quality of life
Expectations about emergency care	Financial impact of a dental emergency for the user	Impact on the emergency need in populations with and without water fluoridation		Impact of previous traumatic experience
Cultural values and norms of the population that access emergency dental services	Use of the service before and after organizational changes (adhesion to protocols, risk classification, training)	Agreement between professionals, managers and coordinators from different points of the RUE		Studies that relate the point of care and access to emergency through measures of quality of life
Changes in the stance of professionals in the organization of emergency care	Use of services after changes in the ECN			
Prevention and management of dental trauma				
User knowledge on the service Disabled people				
Anxiety				

Figure