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Emergency Department and Dental Clinic Perceptions of Appropriate, and Preventable, Use of the ED for Non-Traumatic Dental Conditions in Hot-Spot Counties: A Mixed Methods Study

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Emergency Department and Dental Clinic Perceptions of Appropriate, and Preventable, Use of the ED for Non-Traumatic Dental Conditions in Hot-Spot Counties: A Mixed Methods Study

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and Anastasia Stepanov³

Abstract

Objectives: Frequency of emergency department (ED) use for nontraumatic dental conditions (NTDC) is a well-researched community health concern. However, research predominately relies on ambulatory ED discharge records. This explanatory sequential mixed methods study reviewed NTDC ED use in hot-spot counties and assessed perceptions around preventable and appropriate use among EDs and dental clinics. **Methods:** Tooth pain data (2015-2021) were drawn from State Medicaid, and the Early Notification of Community-Based Epidemics (ESSENCE). NTDC data were compiled using International Classification of Disease, Ninth and Tenth Revisions. Employing extreme case sampling, providers in counties with the highest per-capita NTDC ED use were interviewed. **Results:** North Dakota experienced a decline in NTDC ED visits between 2017 and 2020, though the rate is now increasing. The greatest proportion of NTDC ED visits were among persons ages 20 to 34 and 35 to 44. ED and dental care staff have misconceptions around each other's roles in reducing NTDC ED visits, but unanimously suggest community-level prevention as a solution. **Conclusions:** NTDC ED use was perceived as “appropriate” care. However, there is consensus that improved access to, and utilization of, affordable and quality preventative dental care would reduce NTDC ED visits and improve overall community health, especially among populations experiencing greater inequities.

Keywords

emergency departments, dental, pain, population health, Medicaid

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Introduction

Dental care provided in the emergency department (ED) is nearly 3 times as costly as a visit to the dentist, averaging around \$749 per visits (if the patient is not hospitalized).¹ The estimated cumulative expense is \$1.6 billion each year; 33% of which is covered by Medicaid. Outside of personal and societal expense,² use of the ED for non-traumatic dental conditions (NTDC) often results in inefficient and inadequate care provision. NTDC ED visits predominately relate to dental pain and infection which are more appropriately (and cost-effectively) managed in a dental setting.^{3,4}

When patients present to the ED with a NTDC, they are encouraged to follow-up with a dental provider.⁴⁻⁶ This is

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costly, time consuming, and inefficient use of healthcare services⁵ and individuals experiencing greater health inequities are often unable to follow through on the referrals.^{7,8}

A scoping review concluded that research has not established homogeneity among individuals who frequently utilize the ED for NTDC⁴ surmising that local and state-based initiatives must assess community-level need, and not rely on national trends.^{4,5} Much of this research relies on secondary data review, and/or hospital discharge and claims data.^{4,9-12} Although primary and secondary quantitative data can promote data-driven decision making, it lacks the description and lived experience of the individuals providing care for those who seek emergency dental services.

Understanding the call for local research to inform the practice of public health and private dentistry,^{1,4,5} this applied research employed an explanatory sequential mixed method design in 1 state. As a discipline, mixed methods are “an important methodology to investigate complex health-related topics.”^{13,14} The aims of this research were to identify use of the ED for NTDC (quantitative strand), and to understand and describe perceptions and experiences of ED and dental clinic staff in counties with the greatest rate per capita of NTDC ED visits (qualitative strand). The quantitative data are intended to identify the extreme cases for the qualitative sample, and to present NTDC ED use for discussion among ED and dental clinic staff.

Researchers had 3 hypotheses:

1. Provider descriptions of patient NTDC ED use (qualitative strand) will corroborate descriptive statistics around presentation to the ED for NTDC in North Dakota (quantitative strand).
2. Both dental and ED providers will identify and describe comparable reasons patients in high-use counties present to the ED For NTDC.
3. In concurrence with extant relevant literature, dental and ED providers in identified high-use counties will perceive use of the ED for NTDC as misuse.

This study is one of a limited body of research employing mixed methods, and extreme sampling in qualitative research to better understand NTDC ED visits.

Methods

The initial quantitative strand analyzed secondary data to assess NTDC ED use by county.¹⁴ From the developed heat map (Figure 1), dental and ED teams in 4 counties with the highest per-capita rate of NTDC ED use were invited to participate in key informant interviews. The interviews sought to better understand and describe of the rates of NTDC ED visits, while also generating discussion around proposed community-based solutions. This research was approved by the University’s Institution Review Board.

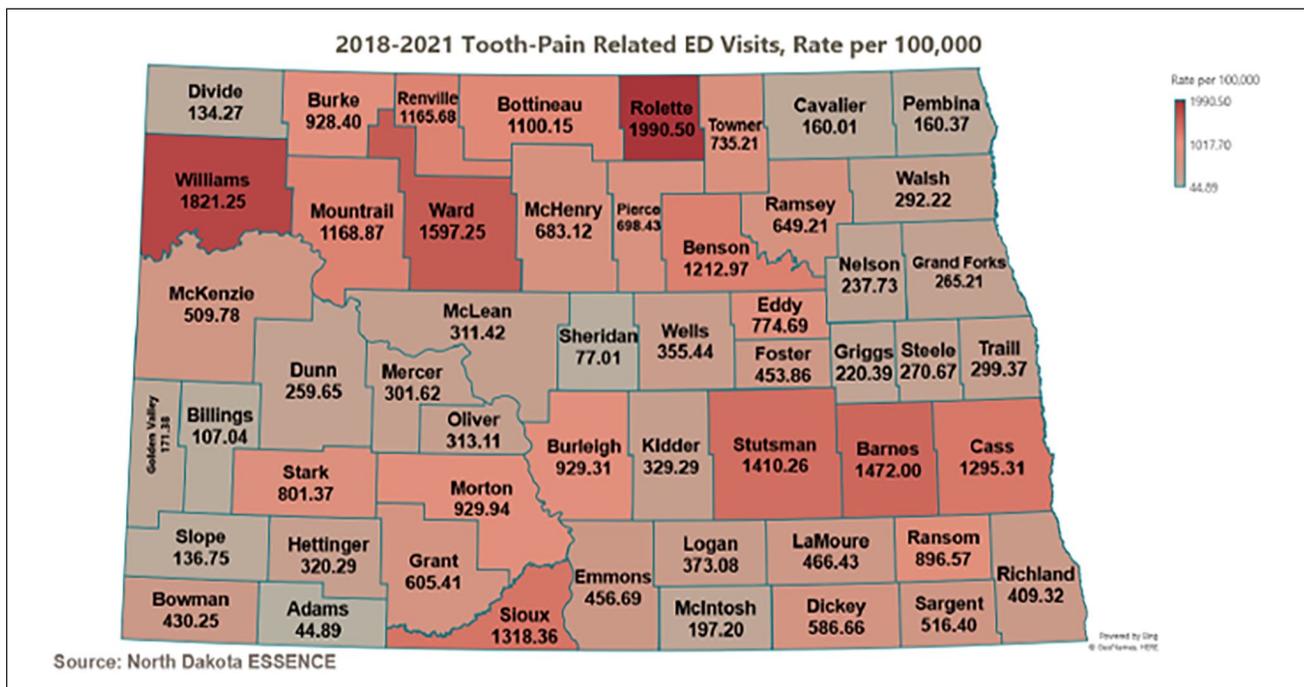


Figure 1. Heat map of NTDC visits rates per 100,000 population in North Dakota: combined years 2018 to 2021. Source: North Dakota ESSENCE. Counties included in this research were Cass, Stutsman, Ward, and Williams.

Table 1. Descriptive Statistics: Persons Utilizing ED for NTDC 2016 to 2021 in North Dakota.

	ESSENCE data					
	2016	2017	2018	2019	2020	2021
Number of NTDC ED visits	2002	2490	2216	1866	1567	1967
Ages (percentage of total sample)						
0-17	5%	6%	6%	5%	5%	6%
18-24	15%	14%	12%	13%	13%	12%
25-34	40%	39%	36%	36%	36%	33%
35-34	19%	20%	20%	22%	22%	23%
45-54	12%	12%	12%	13%	13%	13%
55-64	6%	6%	8%	7%	6%	7%
65-74	2%	2%	3%	3%	4%	3%
75+	1%	2%	2%	1%	2%	2%
	Medicaid Data					
Medicaid beneficiaries with NTDC ED visits				2296	1567	
NTDC ED visits with duplication				5595	4185	
Ages (percentage of total sample)						
0-4				5.0%	4.3%	
5-9				15.4%	10.0%	
10-14				10.5%	7.8%	
15-19				5.1%	5.1%	
20-34				28.0%	33.5%	
35-44				17.3%	18.9%	
45-54				7.3%	9.5%	
55-64				6.9%	8.2%	
65+				4.5%	2.8%	
NTDC ED visits: Percentage of visits by primary diagnosis						
Periapical abscess without sinus				42.1%	53.1%	
Dental examination and cleaning with abnormal findings				30.1%	13.1%	
Other specified disorders of teeth and supporting structures				25.0%	30.3%	
Periodontal disease, unspecified				1.3%	0.7%	
Aggressive periodontitis, unspecified				0.1%	0.3%	
Chronic periodontitis, unspecified				0.2%	0.7%	
Disorder of teeth and supporting structures, unspecified				0.9%	1.6%	
Chronic apical periodontitis				0.3%	0.3%	

Quantitative Data Sources and Analysis

NTDC ED data were collected from: (1) the North Dakota Medicaid office; and, (2) the North Dakota Electronic Surveillance System for the Early Notification of Community-Based Epidemics (ESSENCE). ESSENCE is “a secure web-based tool that enables health care practitioners to monitor health indicators of public health importance for the detection and tracking of disease outbreaks.”¹⁵ These data were collected for the purpose of understanding trends, and in the identification of the extreme sample; the qualitative strand is the primary focus of analysis.

Existing literature describe the purpose, collection, and use of ESSENCE data.¹⁶ Visits for NTDC were identified using the following International Classification of Disease (ICD), Ninth Revision, Clinical Modification (ICD-9-CM)

codes: 525.9, K08.8, K08.9, and K08.89, and the following ICD-10 codes: Z01.21, K00, K01, K023, K03, k04, K04.5, K04.7, K05, K05.20, K05.30, and K05.6. Data included all ED visits between 2016 and 2021, all ages and payers.

Data provided by the State Medicaid Office included all beneficiaries who visited the ED for 1 of 8 primary diagnoses in the years 2019 and 2020 (Table 1). If 1 beneficiary utilized the ED for a NTDC more than 1 time, each visit was counted. The research team was interested in identifying EDs within the state that were experiencing higher volume, regardless of the number of unique patient visits. Medicaid data were reviewed to better understand (and compare) the experiences reported by the interviewees. ESSENCE data included patient cases as reported by health systems, but omits patients who were identified as covered by Medicaid.

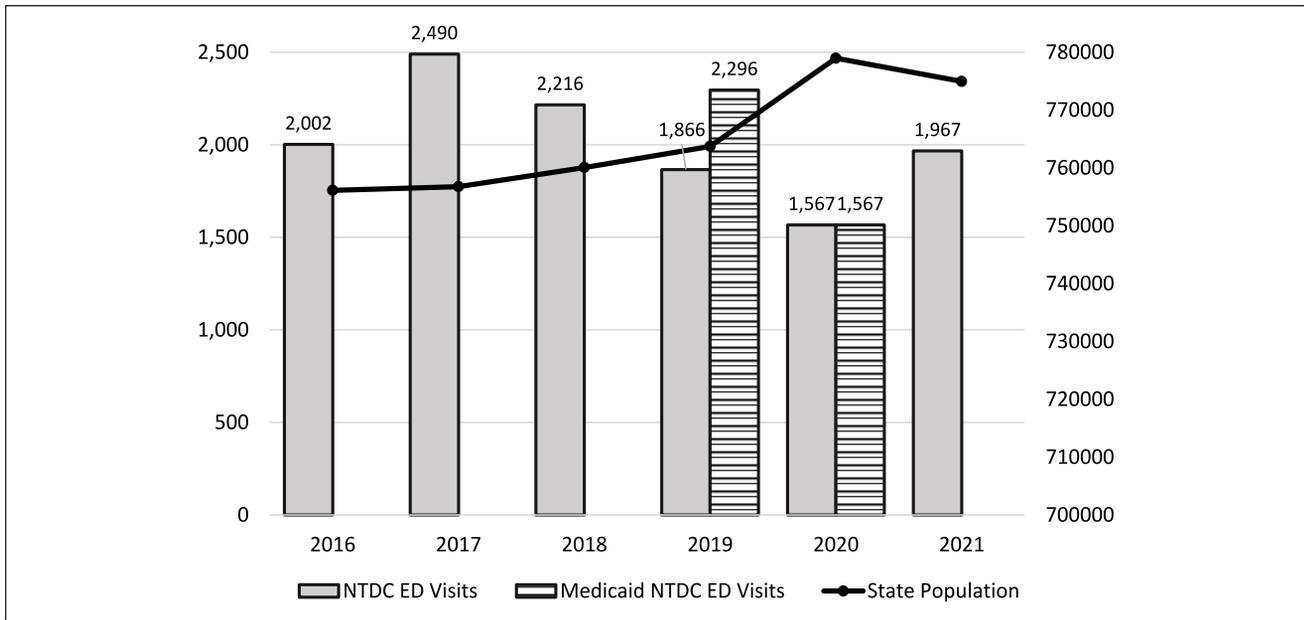


Figure 2. Number of NTDC ED visits among ESSENCE and medicaid data, and state population trends.

Qualitative Strand

One semi-structured interview guide was developed for use with dental teams, and another for those working within local EDs. See Supplemental Appendix A. Questions were developed utilizing findings from the quantitative strand, input from dental associations and organizations in the state, and review of the extant literature. Sequential, mixed methods sampling¹⁴ identified extreme cases for the qualitative strand. Purposeful extreme case sampling includes selecting interviewees based on experience with the studied phenomenon (NTDC ED use), their membership in an extreme case (highest per-capita use of the ED), and their willingness to participate. Not all extreme case counties had individuals willing or able to participate at the time of data collection. For example, Rolette County presented with the highest per capita use of ED for dental concern, but they did not have individuals with experience who were willing to participate at the time of this study. They are working to participate in future work. Two counties meeting the criteria were identified from the western half of the state, and 2 in the eastern (Figure 1).

Interviews were 1 hour and held by videoconference or phone. Interviewees in the west were invited between August and October 2020, and those in the east were held between October 2021 and February 2022. The gap in data collection reflects grant cycles for data collection. Interviews that were conducted under funding in year 1 included extreme cases in the west. During the second year, data were collected from extreme cases in the east. Interviews collected perspectives of providers working in

private practice, federally qualified health centers (FQHCs), and donated dental programs. Interviewees were ensured anonymity which also required omitting participant demographic data. The interviews were not recorded to increase willingness to participate, but detailed notes and direct quotes were captured by the interview teams.

Researchers employed inductive coding for both ED and dental interviews separately; codebooks were compared and consolidated. The consolidated codebook was reviewed by the team, and thematic analysis followed. Final codes, raw data, and themes were provided to the original interviewers who approved the analysis.

Data Integration

The primary purpose of employing an explanatory sequential mixed method design is to ensure that individuals understand the depth and community-level impact around NTDC ED visits that cannot be understood through quantitative research alone. Following thematic analysis, the research team compared conclusions drawn around NTDC ED visits with trends in the numeric data. This stage of data integration allowed researchers to confirm or challenge the perspectives of providers while developing joint display.¹³ This also served as a validity check.

Results

There were 12,108 tooth pain-related events (NTDC) reported through ND ESSENCE over a five-year period

(2016-2021) in a state with fewer than 800,000 residents. Visits steadily declined between 2017 and 2020, in contrast with state population growth. Two years of Medicaid data (2019-2020) reported a total of 9780 NTDC ED visits among 3863 Medicaid beneficiaries. See Figure 2 and Table 1.

The greatest proportion of NTDC ED visits occurred among persons who were between ages 25 and 34, followed by ages 35 to 44; this was consistent between both the ESSENCE and Medicaid data files. See Table 1. These trends are also consistent with extant literature, the most recent of which found that ED visits for dental conditions were greatest among young (ages 20-34) and middle-aged adults (ages 35-49).¹⁷⁻¹⁹ It is possible that this age cohort presents more frequently to the ED for NTDC because it is also the age group that reports lower preventative dental visits. Future research should explore how young and middle-aged adults make decisions about preventative dental health care, and assess their access to private and public dental benefits.¹⁹

The team had to combine years of data to explore race. Other than persons who are Asian (reporting 318 visits per 100,000 patients), those who reported race as Black (2402 per 100,000) or American Indian/Alaska Native (1937 per 100,000) had a higher rate of NTDC ED visits, per capita, than those who are White (621 per 100,000).

The NTDC ED per capita visit rate for the state (using combined data for years 2018-2021) was 1001.58 per 100,000 persons (2018 population data). The counties explored in the qualitative strand included Cass, Stutsman, Ward, and Williams. See Figure 1.

Interviews included 5 EDs, 12 private practice dental providers, 2 FQHC dental offices, and an organization providing dental extraction 1 day a week. Eight of the 15 dental teams reported staff on call to treat any patients with emergent need outside of normal office hours. Three indicated staff on call to treat outside of office hours, but only for patients of record. Four did not treat patients outside of normal office hours. Three of those 4 were clinics that serve as safety-nets for patients with emergent needs during regular business hours. Outside of the 3 whose care model is to specifically serve patients who qualify for medical assistance (MA), only 4 interviewees accepted any patient with MA for regular dental care; 4 dental team members indicated they do not, 2 indicated they would accept children on MA, and 2 indicated they would only see established patients who go on MA.

Hypothesis One: Provider Description of NTDC ED use Corroborates Descriptive Statistics

Researchers rejected hypothesis one. ED providers reported that the number of patients presenting with dental

pain in their county was not high. This contradicts the quantitative data. NTDC ED visits underestimate the true frequency because of the narrow scope for diagnostic codes and exploring only primary diagnosis. Regardless, the reported rates contradict perspectives of those interviewed who attested that use of the ED was not a community concern. Participants reported seeing NTDCs “One a day maybe”; “hardly ever”; and “we probably see one patient per day for tooth pain—1% or less of our traffic so it just isn’t on our radar.” Dental providers shared similar experiences with 1 specifically indicating that they have “emergency time held every day and we don’t get that many calls or no calls.”

Hypothesis Two: Providers Agree on Reasons for NTDC ED Visits

Researchers rejected hypothesis two. Though there was some agreement, ED and dental teams had conflicting perceptions around NTDC ED use. All ED providers indicated wait time for dental care was one of the reasons patients present to the ED with NTDC. See Table 2. However, wait time had the lowest level of agreement from dental providers. Only 6 of the 15 dental interviews mentioned timely dental care as an issue, and when they did, most phrased the response as *patients perceive* timely access as a concern, not that it is founded. One interview believed this is a common excuse, patients “go to the ER and say ‘well, I tried to get in and nobody would let me in’ and I don’t believe that’s true!”

Twelve of the 15 dental teams specifically indicated that patients not having a dental home is a root-cause of increased use of the ED, only 1 of the 5 ED interviewees mentioned access to regular dental visits as a contributing factor. Although ED providers were clear that opioids were not the preferred treatment for patients who present to the ED with dental pain, nearly half (7) of dental providers believed that opioid prescribing was one of the primary reasons patients visited the ED for NTDC. “There is a lot of drug seeking in our area. [ED] is one of the easiest ways to get it. You have a toothache, and you know that you aren’t going to get scans or take your tooth out, so you can get your day or two drug supply; whatever you need.”

One explanation identified among all interviewees (dental and EDs) included lack of access to preventive and treatment-based services for patients with no dental insurance and/or who are covered by MA. See Table 2. ED interviewees voiced concern that there were not enough dental providers in the state who would accept patients covered by Medicaid. Conversely, dental teams provided explanations for not accepting Medicaid centering around the filing burden and low reimbursement, as well as stigmatizing perceptions of persons covered by Medicaid.

Table 2. Joint Display of Perceptions and Actual Use of ED for NTDC Among Medicaid Beneficiaries in North Dakota.

	No dental home	No timely access to dental	Out-of-pocket cost	MA concerns or no insurance	MA	Quantitative data: Demonstration of NTDC ED use among patients covered by medicaid																														
ED Interviews	1	X	X	X	X	<p>Number of NTDC ED Visits</p> <p>Year</p> <p>Legend: ESSENCE (light grey), Medicaid (dark grey)</p> <table border="1"> <caption>Number of NTDC ED Visits</caption> <thead> <tr> <th>Year</th> <th>ESSENCE</th> <th>Medicaid</th> </tr> </thead> <tbody> <tr> <td>2019</td> <td>~1800</td> <td>~2200</td> </tr> <tr> <td>2020</td> <td>~1500</td> <td>~1800</td> </tr> </tbody> </table>	Year	ESSENCE	Medicaid	2019	~1800	~2200	2020	~1500	~1800																					
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3	X	X	X	X																																
4	X	X	X	X																																
5	X	X	X	X																																
Dental Interviews	1	X	X	X	X	<p>Percentage of NTDC ED Visits</p> <p>Age Categories</p> <p>Legend: Year 2019 (light grey), Year 2020 (dark grey)</p> <table border="1"> <caption>Percentage of NTDC ED Visits by Age Category</caption> <thead> <tr> <th>Age Category</th> <th>Year 2019</th> <th>Year 2020</th> </tr> </thead> <tbody> <tr> <td>65 +</td> <td>~5%</td> <td>~8%</td> </tr> <tr> <td>55 - 64</td> <td>~10%</td> <td>~12%</td> </tr> <tr> <td>45 - 54</td> <td>~12%</td> <td>~15%</td> </tr> <tr> <td>35 - 44</td> <td>~18%</td> <td>~22%</td> </tr> <tr> <td>20 - 34</td> <td>~25%</td> <td>~28%</td> </tr> <tr> <td>15 - 19</td> <td>~8%</td> <td>~10%</td> </tr> <tr> <td>10 - 14</td> <td>~10%</td> <td>~12%</td> </tr> <tr> <td>5 - 9</td> <td>~12%</td> <td>~15%</td> </tr> <tr> <td>0-4</td> <td>~5%</td> <td>~8%</td> </tr> </tbody> </table>	Age Category	Year 2019	Year 2020	65 +	~5%	~8%	55 - 64	~10%	~12%	45 - 54	~12%	~15%	35 - 44	~18%	~22%	20 - 34	~25%	~28%	15 - 19	~8%	~10%	10 - 14	~10%	~12%	5 - 9	~12%	~15%	0-4	~5%	~8%
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MA perceptions and concerns: quotes from interviewees, no duplicates

- “They come here [ED] because even if they don’t have health insurance, we can’t refuse to see them.”
- “One of the biggest reasons is because they don’t have a dentist or dental insurance. They don’t know where else to go, so they come to the ED.”
- “[We need] more dentists that accept Medicaid!”
- “They tell us Medicaid isn’t accepted in the area so they go there [the ED] instead ... we don’t accept Medicaid. We don’t turn them away if they need to be seen, but then they need to pay. . . if Medicaid patients were more responsible with their appointments and actually showed up, we’d all be willing to take more. But, honest to goodness, Medicaid patients are extremely irresponsible at showing up.”
- “I have seen people on MA for complementary, in obvious pain, and that hasn’t worked out so well. The expectation is that they think I owe them something. One gal came in and I was shocked at her attitude. I don’t need that problem here with staff or self. The dental association wanted us to not see Medicaid patients until fees were raised.”
- “Right now, we are not a provider for Medicaid so we let them know they wouldn’t have any benefits coming here.”
- “The reason we stopped had to do with the inefficiencies of the Medicaid system . . . we have patients that don’t have the funds and they need it, especially like special needs patients who we just help them. That’s what we do. We don’t accept Medicaid, we just do the right thing . . . there aren’t a lot of Medicaid accepting offices across the state.”
- “I don’t think there’s a single dentist in town that would not see these patients on Medicaid, but they won’t file it, they’ll write it off and they will do it out of the kindness of their heart because they don’t want to deal with Medicaid . . . I can guarantee you that every single dentist in North Dakota would take Medicaid if it was easier to file.”
- “We try not to take any new ones. Medicaid for dentistry is . . . I lose more money seeing the patient than if I didn’t see one. The other two dentists in this office feel the same.”

Hypothesis Three: Providers Describe use of ED for NTDC as Misuse

Researchers reject this hypothesis. Use of the ED for NTDC was not considered “misuse” and patients were described as accessing care because of pain and/or infection after hours, and on weekends. Dental and ED providers agreed that, at the point of which patients are presenting to the ED, it is (at that time) appropriate to be seeking emergency care. However, there was also consensus that public and population level health could, and should, reduce (or eliminate) need for patients to seek dental care in the ED. Meaning, quality, timely, and equitable access and utilization of preventative services and good dental hygiene could reduce presentation of NTDC in the ED.

Interviewees agreed that even when the ED is the appropriate point of initial treatment (in the case of infection) the patient will still require a dental follow-up, and will likely require tooth extraction or a root canal, neither of which can be performed in the ED.

Limitations

ESSENCE data were provided in descriptive tables following request from the research team (not raw data), and Medicaid data were only available for a 2-year period by chief complaint and patient age. Future research should look to secure raw data files that include payer type and race (at minimum). It will also be important to examine trends in preventative dental visits and use of the ED for NTDC following 2020 when there was limited access to both dental and ED provision in response to the national shutdown (COVID-19). However, the purpose and focal point of this research was the perspectives of the dental and ED teams in the counties identified as extreme cases. As such, the employed quantitative methods were appropriate for identifying the sample and integrating data for analysis. An additional limitation would be the data collection years which overlapped with the COVID-19 pandemic and may have impacted participation and interview recall.

Conclusions

Systematic reviews of literature on the topic of NTDC ED use demonstrate heterogeneity in applied methodologies and in conclusions around common conditions and high-risk populations.^{4,20} Additionally, previous research has narrowly explored quantitative data without capturing perceptions and experiences of those providing care to these communities.^{4,9-12} This research indicates that providers do not always perceive NTDC ED use as significant of a concern as is demonstrated in the quantitative data; meaning, without local qualitative data collection and community-level intervention, NTDC ED use will not improve.

Interviewees did corroborate the descriptive statistics around use of the ED for NTDC among patients on MA. However, interviewees did not perceive ED visits for NTDC were high in their respective counties. If counties with the highest rates of NTDC ED use do not perceive high volume, they may be less likely to participate in community-level prevention efforts. These incongruencies and misperceptions can stall public health interventions including ED diversion and dental referral programs like those promoted among the American Dental Association.¹ Providers are not likely to participate in any innovative public health or community-based programming that increases personal workload if they do not perceive a positive return on investment for community and health systems.

Promising practices in reducing NTDC ED visits include ED diversion programs, as well as strong referral procedures to ensure patients receive follow-up dental care, and do not readmit in the ED with the same chief complaint.^{1,7} Unfortunately, ED interviewees indicated no protocols or referral practices from the ED to local dental offices and none of them had dental providers on call for emergency services. Twelve of the 15 dental providers reiterated no formal processes in place to receive patients from an ED. Of the 3 that had a process, 1 was an FQHC providing other medical services on site, and 2 utilized a community dental health coordinator, potential models for replication.

Complicating promotion of ED diversion and referral programs is that dental interviewees described NTDC ED use as a result of no dental home, and low or no insurance, but ED providers had a perception that NTDC ED visits were a product of long wait times and lack of access to regular dental care. Dental providers refuted that as a concern and indicated that emergency services for patients (especially those of record), were available, even after-hours. It is important, then, for dental providers who offer this level of access to promote this information to their local emergency services, patients, and community. This is especially true for providers willing to accept patients with MA.^{20,21} In North Dakota, the Medicaid adult dental benefit covers exams, X-rays, cleaning, fillings, surgery, extractions, crowns, root canals, dentures (partial and full), and anesthesia. However, it will be important to find providers willing to accept MA patients.

Participants agreed that patients that present to the ED are presenting when they cannot access regular dental care, and when in extreme pain and/or experiencing infection, which is not misuse. However, they also agreed that appropriate utilization of, and ensured and equitable access to, quality preventative dental care and good dental hygiene could reduce (or eliminate) use of the ED for NTDC.²² The implementation of community-level coordination of services are imperative as this study indicates greater barriers for regular dental care among persons who are BIPOC, and those with MA.²³ Previous research has indicated that

persons experiencing greater health inequities are often unable to, or do not, follow through on their dental referrals.^{7,8} As evident in in Table 2, community members covered by MA do utilize the ED for NTDC, especially young and middle-age adults; these are then the same individuals whom dental providers either hesitate, or refuse, to see for either emergent or preventative care. This may exacerbate NTDC use of the ED and increase oral health inequities.

Several dental providers perceived that patients visit the ED for NTDC to acquire opioids. ED providers contest this and indicated that opioids are not the recommended treatment for patients presenting with NTDC. Potential ED and dental team partnerships and referrals would not only improve quality and cost of care for patients,²¹ but it would provide opportunity to educate dental providers on ED treatment and referral practices.

Dental and ED providers centered around 3 suggestions for reducing NTDC ED visits. The 3 most common solutions included: a dental diversion program from EDs (with a majority of dental providers indicating that the appropriate referral would be to a dentist within a community health center, and not private practice); education campaigns that provide information for patients on access to emergency dental treatment for patients of record, the need for dental homes and regular preventive care, as well as the cost of emergency room treatment compared to the cost of regular preventive dental care; and, increase in quality and affordable care access/provision among community health centers to address both need for regular preventive visits and to respond to emergency treatment need especially among patients with MA. These findings mirror those reported in a 2015 mixed methods study in which interviewees recommended that the community reduce dental visits in the ED through “Medicaid benefit expansion, care coordination, water fluoridation, and patient education.”²⁴

It is important to recognize that these solutions still rely on dental safety nets, and not private practice, to meet the needs of patients seeking emergency dental care. They also place responsibility on patients more than providers and do not address social determinants of health. What previous research and this study concur is that improved access to, and utilization of, affordable and quality preventative dental health care would reduce NTDC ED visits and would improve overall community health, especially among populations experiencing greater health inequities.

Declaration of Conflicting Interests

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Ethical Approval

This research was approved by the University’s Institutional Review Board.

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Data availability

The data that support the findings of this study are available upon reasonable request made to the corresponding author. The data are not publicly available due to privacy or ethical restrictions.

Supplemental Material

Supplemental material for this article is available online.

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