Association Between Dental Caries and *Helicobacter Pylori* Infection in Tripoli, Libya

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Abstract

INTRODUCTION: Dental caries is a major global issue that has been connected to a number of systemic issues, necessitating multidisciplinary investigation. Examining dental degradation in conjunction with *Helicobacter pylori* infection provides a unique perspective on gut and oral health in Tripoli, Libya. Previously linked to peptic ulcers and chronic gastritis, *H. pylori* has recently been linked to tooth health. This change in viewpoint is crucial because there was no discernible link between the infection and chronic illnesses like diabetes, hypertension, or even smoking, indicating the necessity for measures to raise awareness of good oral hygiene among afflicted individuals. The prevalence of *H. pylori* was clearly linked to declining dental health when examining Decayed, Missing, and Filled Teeth (DMFT) scores; this relationship was particularly evident in older participants and those with poor oral hygiene. **METHODS AND MATERIALS:** a cross-sectional design was used, 135 randomly selected participants to ensure that our sample was representative of the local community. Following a thorough review of each patient's medical history, which included chronic conditions, socioeconomic status, and dental hygiene practices, a dentist qualified to perform this type of evaluation examined each patient for evidence of decay using well-known metrics such as the Decayed, Missing, and Filled Teeth (DMFT) score. Based on previous research, serological tests (detection of *H. pylori* antibodies) were performed to determine the presence of *H. pylori* in order to minimize discomfort and avoid the bias that occasionally arises with more intrusive gut collection methods. **THE AIM:** of this study is to provide a significant contribution to the present literature with genuine potential to influence public health policies and dental care programs targeted at reducing health inequities in the region, provided that the study is carefully planned and some innovative data management is done. **RESULTS:** This result essentially shows that additional interdisciplinary research is required to adequately map out the cause-and-effect relationship between *H. pylori* and dental caries. Curiously, it also supports previous research that suggested this bacterium might contribute to oral disorders, supporting the notion that a comprehensive, multimodal strategy is required to address oral and general health concerns. By lowering the rate of dental decay, local, community-driven initiatives to enhance oral hygiene may hold the key to minimizing the effects of *H. pylori*. The study emphasizes that reducing the disparities in oral health observed in Tripoli may depend on making dental treatment more accessible, particularly for those from lower-income backgrounds. **Conclusion:** An infection with *Helicobacter pylori* is substantially linked to a higher prevalence of dental caries. Both dental decay and *H. pylori* infection are

significantly influenced by age, with poorer oral health being seen in older people. Infrequent dental checkups and poor oral hygiene are two factors that raise the DMFT index. People with diabetes, high blood pressure, and acidity have far worse tooth health. Dental caries is significantly influenced by economic level, with slightly worse outcomes for those with greater incomes. The DMFT score and *H. pylori* prevalence do not seem to be significantly impacted by smoking or gender. This study confirms our presumptions between *H. pylori* and dental cavities while highlighting the critical necessity for integrated healthcare systems.

Keywords: Dental Caries, *Helicobacter Pylori*, Gastritis, Tripoli, Libya.

Introduction

Recently, there has been an unanticipated blending of oral health and general well-being. People have started to realize that bacterial infections, which are typically the cause of gastrointestinal problems, may also contribute to tooth damage. Consider *Helicobacter pylori*, a gram-negative bacterium best known for causing gastrointestinal distress, but recent evidence also suggests it may have a role in dental damage. Findings from many studies, including one conducted in Tripoli, Libya, indicate a connection between the presence of *H. pylori* and an increased risk of dental decay. This new link becomes even more important in Libya, where oral issues are widespread due to public health obstacles, financial hardships, and a lack of dental services [1, 2].

It turns out that our general health practices are closely linked to how we take care of our teeth and our financial circumstances. According to research, poor oral hygiene, which is all too typical in poorer nations, may exacerbate dental problems and potentially facilitate the transmission of *H. pylori* through saliva or oral-fecal contact [3, 4]. The situation becomes much more complicated when you include the combination of age and gender differences; older persons and gender-based behaviors may play a significant role in making certain people more susceptible to decay and this bacterial illness [5, 6]. For example, the information that is currently available from Libya suggests that elderly populations are more susceptible to oral and gastrointestinal problems, suggesting the need for more specialized health care. Numerous investigations conducted worldwide support the theory that *H. pylori* may contribute to dental damage. In general, people who test positive for the bacterium have greater tooth decay than people who do not, this is an odd pattern that demands further investigation, particularly in light of Libyan culture [7, 8]. Researchers who break down data according to socioeconomic status also discover that those with lower incomes frequently experience a double burden: in addition to receiving subpar dental treatment, they also frequently have higher rates of *H. pylori* infection [9, 10]. The steadily increasing number of non-communicable diseases and the mounting number of dental disorders that, if left untreated, may lead to more serious health difficulties only heighten the urgency. When *H. pylori* infections and tooth decay occur together, especially in susceptible populations like children and the elderly, it encourages policymakers and medical experts to reconsider their present public health strategies. Reducing oral and systemic issues may be possible by prioritizing greater dental education, easier access to care, and enhanced cleanliness [11, 12].

In summary, understanding the connection between *H. pylori* and tooth decay not only expands our understanding of the relationship between oral and systemic health, but also emphasizes the necessity of comprehensive public health strategies. Setting this investigation in the context of Tripoli, Libya, provides new local perspectives and emphasizes how daily routines and sociodemographic variables may influence health outcomes. Future research on improved dental care in comparable contexts is made possible by this type of

study, and a more comprehensive strategy appears to be essential for reducing health disparities and eventually improving many people's quality of life [13-17]. In most situations, tackling these issues holistically will be essential to enhancing community health and lowering inequality in the future [18, 19].

Materials and Methods

This study aimed to investigate if *Helicobacter pylori* infection could be connected to dental caries in Tripoli, Libya, building on previous theories on the relationship between our mouths and bodies. Initially, we used a cross-sectional design with 135 randomly selected participants to ensure that our sample was representative of the local community. Following a thorough review of each patient's medical history, which included chronic conditions, socioeconomic status, and dental hygiene practices, a dentist qualified to perform this type of evaluation examined each patient for evidence of decay using well-known metrics such as the Decayed, Missing, and Filled Teeth (DMFT) score. Based on previous research, serological tests (detection of *H. pylori* antibodies) were performed to determine the presence of *H. pylori* in order to minimize discomfort and avoid the bias that occasionally arises with more intrusive gut collection methods [2]. After that, we used some quite sophisticated software to analyze the data and do a number of comparisons because it could handle very complicated datasets. We initially verified that our variables behaved normally; chi-square tests were used for the discrete variables and ANOVA was used to separate the continuous ones [3]. Building on earlier beliefs on the connection between our mouths and bodies, the goal of this study was to determine whether *Helicobacter pylori* infection could be linked to dental caries in Tripoli, Libya. To start, we employed a cross-sectional design with 135 individuals chosen at random to make sure our sample was typical of the neighborhood. A dentist certified to conduct this kind of evaluation carefully reviewed each patient's medical history, including chronic conditions, socioeconomic status, and dental hygiene habits. Then, using established metrics like the Decayed, Missing, and Filled Teeth (DMFT) score, the dentist looked for signs of decay in each patient. According to earlier studies, serological tests (detection of *H. pylori* antibodies) were performed to determine the presence of *H. pylori* in order to reduce discomfort and prevent the bias that often occurs with more invasive gut collection techniques [2]. Since the software could handle extremely complex datasets, we then utilized it to evaluate the data and perform a variety of comparisons. Using chi-square tests for the discrete variables and ANOVA to isolate the continuous ones, we first confirmed that our variables behaved normally [7]. Ethical issues were not treated lightly; all parties gave their informed consent, and the appropriate authorities' approvals were acquired [20]. Although it wasn't the main goal of this study, it could have been intriguing to use a mixed-methods approach to also record patients' attitudes regarding their dental health and *H. pylori* infection [8]. To validate these preliminary results and disentangle the processes between *H. pylori* infection with tooth decay, future studies involving bigger and more diverse populations are probably required [9]. Overall, this study's rigorous yet adaptable design not only increases our confidence in the findings but also establishes the framework for further research into the complex relationships between oral and systemic health, especially in economically disadvantaged, resource-constrained environments like Libya [10, 11].

This effort aims to provide a significant contribution to the present literature with genuine potential to influence public health policies and dental care programs targeted at reducing health inequities in the region, provided that the study is carefully planned and some innovative data management is done [12, 13]. Knowing how dental caries and *H. pylori* infection interact could eventually aid in developing preventative strategies that consider Libya's distinct cultural and socioeconomic context [14-17]. In the end, resolving these two problems

could improve dental results and foster a general increase in wellbeing for persons dealing with these medical conditions [18, 19].

Statistical Methods

The study used a number of statistical methods to investigate the relationship between dental caries and *Helicobacter pylori* infection, as well as the influence of health-related and demographic factors on the DMFT score. Categorical variables such *H. pylori* status, gender, age distribution, oral hygiene habits, and economic position were summarized using descriptive statistics, such as frequencies and percentages. The relationships between *H. pylori* infection and categorical factors, such as gender, age, acidity, oral hygiene practices, economic status, and systemic diseases (such as diabetes and hypertension), were evaluated using chi-square tests. Individuals with and without chronic diseases, smokers and non-smokers, and participants with and without *H. pylori* were among the groups whose mean DMFT index was compared using independent t-tests. To assess variations in the DMFT index among several categorical categories, such as age, degree of oral cleanliness, financial position, and frequency of dental examinations, one-way analysis of variance (ANOVA) was used. All statistical tests were conducted at a significance threshold of $p < 0.05$. Version 27 of SPSS was used for statistical analysis.

Results

Helicobacter pylori prevalence among participants is displayed in Table No. 1. Of the 135 subjects, 54 (40.0%) had negative *Helicobacter pylori* tests, while 81 (60.0%) had positive ones. our suggests a rather high incidence of *Helicobacter pylori* infection in our population, as the majority of subjects (60%) had the infection.

Table 1: Prevalence of *Helicobacter Pylori* Among Participants.

Helicobacter Pylori	Count	%
Positive	81	60.0
Negative	54	40.0
Total	135	100.0

Table 2: Gender Distribution of Participants.

Gender	Count	%
Male	48	35.6
Female	87	64.4
Total	135	100.0

The gender distribution of the study participants is shown in table No. 2. Of the 135 participants in the study, 87 (64.4%) were women and 48 (35.6%) were men. This suggests that a larger percentage of sample participants were female, making up over two-thirds of the population.

Table 3: Age Distribution of Participants

Age	Count	%
20-29	31	23.0
30-39	44	32.6
40-49	44	32.6
50-59	16	11.9

Total	135	100.0

The age distribution of the study participants is shown in Table No. 3. With 32.6% (n = 44) of the sample falling into each age group, the bulk of participants were in the 30–39 and 40–49 age ranges. Participants between the ages of 20 and 29 made up 23.0% (n = 31), whereas the age group between the ages of 50 and 59 made up the smallest percentage (11.9%; n = 16). According to the distribution, the majority of participants were in the 30- to 49-year-old age range.

Table 4: Age-wise Distribution of *Helicobacter Pylori* Status Among Participants.

Age	*Helicobacter Pylori*			
	Positive		Negative	
	Count	%	Count	%
20-29	8	5.9	23	17.0
30-39	19	14.1	25	18.5
40-49	38	28.1	6	4.4
50-59	16	11.9	0	0.0
Total	81	60.0	54	40.0

The distribution of *Helicobacter pylori* infection in various age groups is shown in table No. 4. Participants between the ages of 40 and 49 had the highest infection rate (28.1%), with only 4.4% of them testing negative. In a similar vein, every individual in the 50–59 age range (11.9%) had a positive *H. pylori* test, meaning that the infection rate was 100%.

Conversely, infection rates were lower among younger people. Just 5.9% of people in the 20–29 age range tested positive, while 17.0% tested negative. Similarly, among those aged 30 to 39, 14.1% were positive and 18.5% were negative.

According to these findings, the frequency of *H. pylori* infection appears to be rising with age, peaking in those over 40. This pattern might point to age-related sensitivity or the cumulative effect of exposure over time.

Table 5: Gender-wise Distribution of *Helicobacter Pylori* Status Among Participants

Gender	*Helicobacter Pylori*			
	Positive		Negative	
	Count	%	Count	%
Male	32	23.7	16	11.9
Female	49	36.3	38	28.1
Total	81	60.0	54	40.0

The distribution of *Helicobacter pylori* infection among male and female participants is displayed in Table No. 5. According to the findings, a greater percentage of females (36.3%) than males (23.7%) tested positive for *H. pylori*. Similarly, compared to men (11.9%), more women (28.1%) tested negative. Overall, the results indicate

that although *H. pylori* infection is common in both sexes, more female participants had the infection. However, as there were more female participants than males, this discrepancy might have been impacted by the sample's gender distribution.

Table 6: Association of Various Variables with *Helicobacter Pylori* Status: Chi-Square Analysis Results

Variables	Categories	*Helicobacter Pylori*				Chi square	P value
		Positive		Negative			
		Count	%	Count	%		
Gender	Male	32	23.7	16	11.9	1.379	0.240
	Female	49	36.3	38	28.1		
Age	20-29	8	5.9	23	17.0	43.697	< 0.001
	30-39	19	14.1	25	18.5		
	40-49	38	28.1	6	4.4		
	50-59	16	11.9	0	0.0		
Acidity	No	45	33.3	40	29.6	4.765	0.029
	Yes	36	26.7	14	10.4		
OHcare	Low	33	24.4	6	4.4	13.890	< 0.001
	Mild	27	20.0	26	19.3		
	High	21	15.6	22	16.3		
Regular dental checkup	Every 6 month	7	5.2	7	5.2	4.176	0.124
	Once a year	25	18.5	24	17.8		
	Just when need	49	36.3	23	17.0		
Economic level	Less than 1000	33	24.4	18	13.3	1.108	0.575
	1000-2000	29	21.5	24	17.8		
	More than 2000	19	14.1	12	8.9		
Hypertension	No	64	47.4	48	35.6	2.236	0.135
	Yes	17	12.6	6	4.4		
Diabetic	No	60	44.8	42	31.3	0.471	0.492
	Yes	21	15.7	11	8.2		
Smoking	No	60	44.4	44	32.6	1.005	0.316
	Yes	21	15.6	10	7.4		
Previous infection	No	56	41.5	31	23.0	1.945	0.163
	Yes	25	18.5	23	17.0		

Table No 6, presents the results of a chi-square analysis examining the association between *Helicobacter pylori* infection status and various demographic, health, and lifestyle factors.

- **Gender:** No significant association was found between gender and *H. pylori* infection ($\chi^2 = 1.379$, $p = 0.240$), indicating that infection rates did not differ significantly between males and females.
- **Age:** A significant association was observed between age and *H. pylori* infection ($\chi^2 = 43.697$, $p < 0.001$). The infection rate increased with age, with the highest prevalence observed in the 40–49 and 50–59 age groups.

- **Acidity:** A significant association was found between acidity and *H. pylori* infection ($\chi^2 = 4.765$, $p = 0.029$), suggesting that individuals with acidity were more likely to test positive for the infection.
- **Oral Hygiene Care:** A significant relationship was found between oral hygiene care and *H. pylori* infection ($\chi^2 = 13.890$, $p < 0.001$). Participants with low oral hygiene care had a higher infection rate compared to those with mild or high oral hygiene practices.
- **Regular Dental Checkups:** No significant association was observed between dental checkup frequency and *H. pylori* infection ($\chi^2 = 4.176$, $p = 0.124$).
- **Economic Level:** No significant association was found between economic level and infection status ($\chi^2 = 1.108$, $p = 0.575$).
- **Hypertension:** There was no statistically significant association between hypertension and *H. pylori* infection ($\chi^2 = 2.236$, $p = 0.135$).
- **Diabetes:** No significant association was detected between diabetes and *H. pylori* infection ($\chi^2 = 0.471$, $p = 0.492$).
- **Smoking:** The analysis did not show a significant association between smoking and *H. pylori* infection ($\chi^2 = 1.005$, $p = 0.316$).
- **Previous *H. pylori* Infection:** No significant association was found between a history of H. pylori infection and current infection status ($\chi^2 = 1.945$, $p = 0.163$).

According to the findings, there is a substantial correlation between *H. pylori* infection and age, acidity, and oral hygiene practices. This suggests that older people, those who experience acidity, and those who have poor dental hygiene are more susceptible to infection. Other variables, including smoking, economic status, gender, and long-term health issues like diabetes and hypertension, did not, however, exhibit any noteworthy correlations. These results demonstrate the possible contribution of lifestyle and health-related behaviors on the prevalence and transmission of *H. pylori*.

Table 7: Impact of Various Factors on DMFT Index: T-Test Results

			DMFT index			
Variables	Categories	N	Mean	Std	T value	P-value
H. Pylori	Positive	81	10.47	3.546	9.583	< 0.001
	Negative	54	5.74	2.182		
Gender	Male	48	8.81	3.213	0.525	0.600
	Female	87	8.45	4.167		
Acidity	No	85	7.64	3.719	-3.904	< 0.001
	Yes	50	10.18	3.550		
Hypertension	No	112	8.01	3.690	-3.998	< 0.001
	Yes	23	11.35	3.433		
Diabetic	No	102	8.11	3.432	-2.731	0.007
	Yes	32	10.19	4.666		
Smoking	No	104	4.01	4.012	-1.231	0.221
	Yes	31	3.18	3.177		
Previous infection	No	87	8.33	4.054	-0.994	0.322
	Yes	48	9.02	3.436		

Table No7, presents the results of *t*-tests examining the impact of various factors on the Decayed, Missing, and Filled Teeth (DMFT) index. The findings highlight several significant associations:

- ***Helicobacter pylori* Infection:** Participants who tested positive for *H. pylori* had a significantly higher DMFT index (M = 10.47, SD = 3.55) compared to those who tested negative (M = 5.74, SD = 2.18), t(133) = 9.583, p < 0.001. This suggests a strong association between *H. pylori* infection and dental caries severity.
- **Gender:** No significant difference in the DMFT index was observed between males (M = 8.81, SD = 3.21) and females (M = 8.45, SD = 4.17), t(133) = 0.525, p = 0.600.
- **Acidity:** Participants with acidity had a significantly higher DMFT index (M = 10.18, SD = 3.55) compared to those without acidity (M = 7.64, SD = 3.72), t(133) = -3.904, p < 0.001, indicating a potential link between acidity and increased dental decay.
- **Hypertension:** Participants with hypertension had a significantly higher DMFT index (M = 11.35, SD = 3.43) than those without hypertension (M = 8.01, SD = 3.69), t(133) = -3.998, p < 0.001.
- **Diabetes:** A significant difference in DMFT index was found between diabetic (M = 10.19, SD = 4.67) and non-diabetic individuals (M = 8.11, SD = 3.43), t(133) = -2.731, p = 0.007, suggesting that diabetes may contribute to higher rates of dental caries.
- **Smoking:** No significant association was found between smoking and the DMFT index (t(133) = -1.231, p = 0.221).
- **Previous *H. pylori* Infection:** The DMFT index did not significantly differ between individuals with a history of *H. pylori* infection (M = 9.02, SD = 3.44) and those without prior infection (M = 8.33, SD = 4.05), t(133) = -0.994, p = 0.322.

The findings show that diabetes, hypertension, acidity, and H. pylori infection are all substantially linked to a higher DMFT index, indicating that these illnesses may exacerbate dental health issues. However, there were no discernible correlations between smoking, gender, or prior *H. pylori* infection. These results emphasize how crucial it is to take systemic health issues into account when determining the risk of dental caries.

Table 8: Impact of Various Factors on DMFT Index: ANOVA Results

			DMFT index			
Variables	Categories	N	Mean	Std	F value	P-value
Age	20-29	31	4.58[a]	2.306	57.837	< 0.001
	30-39	44	7.41[b]	1.909		
	40-49	44	10.89[c]	3.052		
	50-59	16	13.19[d]	3.016		
OH care	Low	39	10.77[a]	3.166	14.378	< 0.001
	Mild	53	8.57[b]	3.682		
	High	43	6.60[c]	3.593		
Regular dental checkup	Every 6 month	14	6.71[a]	3.148	3.356	0.038
	Once a year	49	8.08[ab]	3.499		
	Just when need	72	9.28[b]	4.060		
Economic level	Less than 1000	51	7.75[a]	4.275	3.331	0.039
	1000-2000	53	8.57[ab]	3.085		

	More than 2000	31	8.97[b]	3.996		

Table No 8, displays the results of ANOVA analyses assessing the effect of age, oral hygiene (OH) care, frequency of regular dental checkups, and economic level on the DMFT index. The findings are as follows:

- **Age:** A significant effect of age on the DMFT index was observed, $F = 57.837$, $p < .001$. The mean DMFT index increased with age, from 4.58 (SD = 2.31) in the 20–29 age group to 13.19 (SD = 3.02) in the 50–59 age group, indicating a clear trend of worsening dental health with increasing age.
- **Oral Hygiene Care:** There was a significant effect of OH care on the DMFT index, $F = 14.378$, $p < .001$. Participants with low oral hygiene had the highest mean DMFT index (10.77, SD = 3.17), whereas those with high oral hygiene reported a lower mean score (6.60, SD = 3.59). This suggests that better oral hygiene practices are associated with lower dental decay and related outcomes.
- **Regular Dental Checkups:** The frequency of dental checkups also had a significant impact on the DMFT index, $F = 3.356$, $p = .038$. Participants undergoing checkups every 6 months had a lower mean DMFT index (6.71, SD = 3.15) compared to those who only attended checkups "just when needed" (mean = 9.28, SD = 4.06), with those checking in once a year falling in between (mean = 8.08, SD = 3.50).
- **Economic Level:** Finally, economic level significantly affected the DMFT index, $F = 3.331$, $p = .039$. Although the differences are modest, participants with an economic level "less than 1000" had a lower mean DMFT index (7.75, SD = 4.28) compared to those in the "more than 2000" bracket (mean = 8.97, SD = 4.00), with the intermediate group (1000–2000) falling between these values.

These findings suggest that a higher DMFT index is linked to older age, worse oral hygiene, fewer dental examinations, and a higher socioeconomic standing. In addition to addressing socioeconomic inequities in oral health outcomes, these factors seem to cumulatively contribute to the decline of dental health, highlighting the significance of routine oral care and dental visits.

The results show that dental health, as determined by the DMFT index, is significantly impacted by *Helicobacter pylori* infection, age, acidity, hypertension, diabetes, and oral hygiene practices. The DMFT index was noticeably greater in those infected with *H. pylori* than in those not. Both dental decay and *H. pylori* infection were significantly correlated with age, with older people showing higher DMFT scores. Infrequent dental visits and poor oral hygiene were also associated with higher DMFT scores. Gender, smoking, and prior *H. pylori* infection did not significantly correlate with either the DMFT index or *H. pylori* prevalence; however, economic level had a moderate impact, with those with lower incomes showing somewhat lower DMFT scores. Socioeconomic position, systemic health issues, and lifestyle factors all influence differences in oral health outcomes, according to the results of the chi-square and ANOVA studies.

Discussion

Unexpected revelations are made on the connection between *Helicobacter pylori* and dental cavities in Tripoli, Libya. Participants in this study have a noticeable *H. pylori* infection, which is consistent with previous research that has connected this bacterium to both digestive problems and oral health problems [1]. It's intriguing that women and those between the ages of 40 and 59 appear to be more impacted; this could point to some underlying socioeconomic factors or lifestyle decisions that, to be honest, merit further investigation. Here, age appears to be a complex aspect. One may argue that changes in daily oral hygiene tend to happen less

frequently as people age, which can exacerbate dental decay and be consistent with earlier research on inferior outcomes in the elderly [2]. However, there is a clear correlation between a higher frequency of *H. pylori* and less attention to oral hygiene, indicating that people with less financial opportunity may benefit more from educational and preventive initiatives [3]. The connection between *H. pylori* and dental health is another intriguing finding. Decayed, Missing, and Filled Teeth scores were generally higher for participants who tested positive for *H. pylori* (DMFT) index. Since research has shown that *H. pylori* can cause systemic inflammation, which exacerbates dental difficulties, this generally suggests a two-way street where a persistent infection harms oral health and may also result in more serious health concerns [4]. The study found no discernible difference in infection rates between people with chronic diseases like diabetes and hypertension and their healthier counterparts. This lack of a clear correlation implies that the impact of chronic illnesses on dental health is somewhat subtle and may be complicated by a variety of lifestyle and socioeconomic factors [5]. It's interesting to note that, despite the fact that persons with greater incomes often maintain better dental health, this advantage appeared to have little effect on the prevalence of *H. pylori*. When it comes to infection, it seems that easy access to dental treatment and appropriate health education may be more important than simple financial considerations [6]. These findings support previous assertions that, although having money helps, it is not the only defense against an infection such as *H. pylori* [7]. The wider ramifications of these discoveries cannot be disregarded. Larger, more exploratory epidemiological studies that could clarify the relationship between oral and systemic health are made possible by the notable presence of *H. pylori* in this Tripoli cohort [20]. The findings make it abundantly evident that tackling *H. pylori*'s effects on tooth health is essential to minimizing inequities in oral health across Libya. There is considerable value in taking into account educational programs that promote frequent dental exams and improved oral hygiene, particularly for people in lower socioeconomic groups [8]. These suggested activities, which seek to emphasize the links between oral and overall health, may even complement more comprehensive public health campaigns. According to Nasiri et al. [10] early *H. pylori* testing and treatment can typically prevent both oral disorders and more serious health issues. According to this research, systemic infections may have a significant impact on oral health, which supports the need for healthcare strategies that treat the two conditions concurrently [11]. Accordingly, targeted public health initiatives could actually improve community health outcomes in Tripoli and perhaps other comparable contexts [11].

Conclusions

An infection with *Helicobacter pylori* is substantially linked to a higher prevalence of dental caries. Both dental decay and *H. pylori* infection are significantly influenced by age, with poorer oral health being seen in older people. Infrequent dental checkups and poor oral hygiene are two factors that raise the DMFT index. People with diabetes, high blood pressure, and acidity have far worse tooth health. Dental caries is significantly influenced by economic level, with slightly worse outcomes for those with greater incomes. The DMFT score and *H. pylori* prevalence do not seem to be significantly impacted by smoking or gender.

In conclusion, this study confirms our presumptions between *H. pylori* and dental cavities while highlighting the critical necessity for integrated healthcare systems. There is genuine potential to create a long-lasting impact by comprehending and treating the frequently complex interaction between dental and general health, especially among different communities.

Recommendations

1. Raise awareness of the possible connection between dental caries and *H. pylori* infection in order to promote early detection and care.
2. Encourage improved oral hygiene habits through educational initiatives, focusing especially on high-risk groups including the elderly and people with underlying medical issues.
3. Promote routine dental examinations, particularly for those with gastrointestinal disorders or acidity.
4. Include dental treatment in more comprehensive healthcare plans for people with diabetes, high blood pressure, and other long-term illnesses.
5. Perform additional study to evaluate the long-term impacts of systemic disorders on oral health and investigate the causative link between dental caries and *H. pylori* infection.
6. Put in place community-based initiatives to improve dental care access, especially for those with lower incomes, in order to lessen inequalities in oral health outcomes.

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