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# **DeepSeek AI's Response to Queries about Dental Caries**

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## **Introduction**

After multiple Artificial intelligence systems(AIS) have been raised in the world, and a new AIS, Deep Seek, gained popularity in early 2025 (4). Deep Seek employs open source, which enables individuals to utilize and modify the source code. Open source enhanced its properties for self-update with the use of available datasets such as Wikipedia and research articles. Deep seek's offline mode has provided a secure and private search engine in the healthcare system, in compliance with regulations and private authorities (4). However, its privacy and accuracy while providing healthcare information in the absence of a qualified professional is still unclear (4).

Dental Caries is a chronic disease that is of medical, social, and economic importance (3). Its cause and control depend on the social, behavioural, and environmental factors at the level of the individual and community, making this a common search topic on AIS (3). In order to investigate this, Deep Seek's AI response to dental caries and its prevention was questioned

Responding to the posted questions, deep seek AI provided accurate and detailed information starting from the bacterial nature of the condition (1) to proven preventative oral hygiene and nutritional strategies. The platform repeatedly provides information about visiting a dentist, which can motivate individuals to seek professional care. Additionally, it cautiously suggested some non-traditional methods, such as oil pulling, which may reduce the risk of caries, due to the current evidence being inconclusive about its use and points towards further research (2).

Given this, Deep Seek AI can help address basic dental queries and drive patients to the dentist when needed. Hence, it might serve a great purpose in helping patients understand the condition before they visit the dentist and be less anxious while visiting. With its repeated learning models and effective communications, Deepseek may also be integrated into existing innovations for caries diagnosis, such as Dent. AI to improve patient care and education (1).

The only concern that was evident during our interaction was the evidence and source of information provided by Deepseek AI. Further studies need to be conducted on the origin of information being provided by deep-seek AI and its data-gathering techniques in real-time.

Table 1

*Summary of DeepSeek AI's response to Dental caries-related queries.*

Question	Summary of DeepSeek AI Response
<b>What is dental caries?</b>	Dental caries, commonly known as tooth decay or cavities, is a bacterial infection that damages the hard structures of the teeth (enamel, dentin, and cementum). It occurs when acid-producing bacteria in the mouth break down sugars from food, leading to demineralization of the tooth surface.
<b>What are the causes of dental caries?</b>	Bacterial Activity: Mainly Streptococcus mutans and Lactobacillus metabolize sugars and produce acids. Plaque Formation : A sticky biofilm of bacteria accumulates on teeth. Sugar & Carbohydrates: Frequent consumption of sugary foods/drinks fuels acid production. Poor Oral Hygiene: Inadequate brushing/flossing allows plaque to persist. Dry Mouth (Xerostomia): Reduced saliva (which neutralizes acids) increases decay risk. Acidic Foods/Drinks: Erode enamel, making teeth more vulnerable.

Question	Summary of DeepSeek AI Response
<b>What are the symptoms of Dental Caries?</b>	<p>Dental caries often develop slowly, and symptoms vary depending on the stage of decay. Here's what to watch for:</p> <p><b>Early Stage (No Pain Yet)</b>                      White or brown spots on teeth (first sign of enamel demineralization), Chalky or dull appearance on the tooth surface.</p> <p><b>Moderate Decay (Enamel &amp; Dentin Damage)</b>                      Tooth sensitivity to: Hot, cold, or sweet foods/drinks and air (when breathing in).                      Visible holes or pits in teeth (cavities).                      Mild to sharp pain when biting down.                      Dark stains (yellow, brown, or black spots).</p> <p><b>Advanced Decay (Pulp Infection &amp; Abscess)</b>                      Persistent toothache (throbbing pain, even without stimulation).                      Pain when chewing or applying pressure.                      Bad breath (halitosis) or foul taste (from bacterial infection).                      Swollen gums near the affected tooth.                      Pus formation (abscess) – a serious infection requiring urgent care. Facial swelling (if infection spreads).</p> <p><b>When to See a Dentist Immediately:</b> Persistent pain (could indicate nerve damage).                      Swelling in gums/face (sign of abscess).                      Broken or visibly decayed teeth.</p>
<b>How to prevent dental caries at home without visiting a dentist?</b>	<p><b>Proper Brushing Technique</b>  <b>Floss Daily</b>  <b>Use Fluoride Products</b>  <b>Cut Down on Sugar &amp; Carbs</b>  <b>Eat Tooth-Friendly Foods</b>  <b>Stimulate Saliva Flow</b>  <b>Oil Pulling (Optional)</b>  <b>DIY Remineralizing Paste</b>  <b>Avoid Acidic Drinks</b>  <b>Tongue Cleaning</b></p> <p><b>When to See a Dentist Anyway:</b> If you notice white spots, sensitivity, or dark patches. For professional cleanings (plaque hardens into tartar, which brushing can't remove)</p>

Question	Summary of DeepSeek AI Response
<p><b>Does eating High Sugar foods causes caries?</b></p>	<p>Yes, eating high-sugar foods significantly increases the risk of dental caries (tooth decay). Here's why and how it happens:</p> <p style="text-align: center;">How Sugar Causes Cavities</p> <p>Bacteria Feed on Sugar: Harmful bacteria in dental plaque (like <i>Streptococcus mutans</i>) break down sugars and fermentable carbohydrates, producing acid as a byproduct.</p> <p>Acid Attacks Tooth Enamel: This acid lowers the pH in your mouth, dissolving minerals (demineralization) from tooth enamel—the first step toward cavities.</p> <p>Repeated Acid Exposure Weakens Teeth. Frequent sugar intake (especially sticky or slow-dissolving sweets) leads to prolonged acid exposure, making enamel erosion worse over time.</p> <p>Worst Sugar Offenders: Sticky sweets (caramel, gummies, dried fruit) cling to teeth longer.</p> <p>Sugary drinks (soda, juice, energy drinks) bathe teeth in sugar and acid.</p> <p>Frequent snacking (constant sugar intake doesn't give saliva time to neutralize acid).</p> <p>How to Reduce Risk: Limit sugary foods/drinks—opt for water or unsweetened alternatives.</p> <p>Rinse with water after consuming sugar to wash away residues.</p> <p>Brush with fluoride toothpaste 30 mins after eating (not immediately, as acid softens enamel temporarily).</p> <p style="text-align: center;">Chew sugar-free gum (with xylitol) to stimulate saliva, which neutralizes acid.</p> <p style="text-align: center;">The Bottom Line</p> <p>Sugar itself doesn't directly cause cavities, but the <b>acid produced by bacteria after sugar consumption</b> does. Reducing sugar intake and maintaining good oral hygiene are key to preventing caries.</p>

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