

## **PICO SEARCH ASSIGNMENT WORKSHEET**

### **Brief description of patient problem/setting (summarize the case very briefly)**

A 5-year-old previously healthy male is brought to the ED by his mother for a persistent cough lasting 4 days. The cough initially began with nasal congestion and a low-grade fever, which have since improved; however, the cough has worsened at night and is now disrupting his sleep. There is no history of shortness of breath, wheezing, vomiting, or choking episodes. He is up to date on vaccinations and has no history of asthma or allergies. On exam, the child is well-appearing, afebrile, and in no respiratory distress, with clear lung sounds bilaterally and no wheezing or crackles. The oropharynx is mildly erythematous without exudates, consistent with a viral upper respiratory infection. The mother reports she has been giving over-the-counter cough syrup with minimal improvement and is concerned about the ongoing nighttime cough, asking if there are safer or more effective alternatives for symptom relief.

**Search question:** Clearly state the question (including outcomes or criteria to be tracked)

In children with viral URI, does honey compared to OTC cough medications provide safer and better symptom relief?

**Question type:** What kind of question is this?

Prevalence

Screening

Diagnosis

Prognosis

**Treatment**

Harm

**Assuming that the highest level of evidence to answer your question will be meta-analysis or systematic review, what other types of study might you include if these are not available (or if there is a much more current study of another type)? Please explain your choices.**

If a systematic review or meta-analysis is not available, I would prioritize randomized controlled trials (RCTs) since they represent a high level of evidence and allow for direct comparison between honey and over-the-counter cough medications in pediatric patients with viral upper respiratory infections. RCTs are particularly useful for this question because randomization helps reduce bias and ensures that outcomes such as cough symptom relief are evaluated in comparable groups. I would also consider including more recent RCTs, as they may better reflect current recommendations and common clinical practices regarding cough management in children. If RCTs are limited, prospective cohort studies could also be helpful. These studies follow pediatric patients over time and provide insight into how honey and OTC medications perform in real-world settings, including effectiveness and tolerability. However, I would avoid relying heavily on case reports or case series, as they do not provide strong comparative data and are more prone to bias.

**PICO search terms:**

<b>P</b>	<b>I</b>	<b>C</b>	<b>O</b>
Pediatrics	Honey	OTC cough medicine	Cough relief
Children		Cough suppressants	Symptom relief/improvement

Viral upper respiratory infection		Dextromethorphan/ Robitussin	Improved sleep
Cough			Cough severity
Common cold			safety

**Search tools and strategy used:**

Please indicate what databases/tools you used, provide a list of the terms you searched together in each tool, and how many articles were returned using those terms and filters. Explain how you narrowed your choices to the few selected articles. For example, if your search returned 25 articles among the several databases used, what was the process used to determine which four articles to use?

Database	Search terms used	# or results	Filters applied
PubMed	("pediatrics" OR "cough" OR "URI") AND ("honey") AND ("dextromethorphan" OR "OTC medicine" OR "Robitussin") AND ("relief" OR "improved sleep" OR "outcome")	11	Last 10 years, meta-analysis, randomized controlled trial, systematic review, English, Humans, Children: birth - 18, MEDLINE
EBSCO	("pediatrics" OR "cough") AND ("honey") AND ("dextromethorphan" OR "OTC medicine" OR "Robitussin") AND ("relief" OR "outcome")	4	Past 10 years, English, All child 0-18 years, Peer Reviewed, MEDLINE complete
Google scholar	("pediatrics" OR "cough" OR "viral URI") AND ("honey" AND ("cough suppressant" OR "dextromethorphan") AND ("relief" OR "sleep outcome"))	716	Time range: 2021-2026, Review articles, sort by relevance

For this PICO question, I used the following databases: PubMed, EBSCO, and Google Scholar. In the PubMed database, I applied the search terms and filters listed above, which resulted in 11 articles. I reviewed the titles to gain a general understanding of each study. Then I read the

abstracts of articles relevant to my PICO to see what type of study design each were. In the end, I selected one article: a systematic review analyzing honey in management of acute cough for children.

In the EBSCO database, applying similar search terms and filters resulted in 4 articles. Using the same approach in PubMed, I reviewed titles to identify studies relevant to my PICO. I did not select any articles from this database since they were not the highest level of evidence studies and some were not relevant to my PICO.

Using similar terms and approach in Google scholars resulted in 716 articles. I narrowed my selection with filters such as “within 10 years” and “sort by relevance”. In the end, I chose 2 articles from this database, both of which were systemic reviews.

### **Results found:**

Identify at least 3 articles (or other appropriate reputable sources) that answer your specific question with the highest available level of evidence (you will probably need to look at more than 3 articles to get the 3 most focused and highest-level articles to address your question). Please make sure that they are Medline indexed.

### **Article 1**

#### **Citation:**

Mashat, G. D., Hazique, M., Khan, K. I., Ramesh, P., Kanagalingam, S., Haq, Z. U., Srinivasan, N. V., & Khan, S. (2022). *Comparing the effectiveness of honey consumption with anti-cough medication in pediatric patients: A systematic review*. *Cureus*, 14(9), e29346.  
<https://doi.org/10.7759/cureus.29346>

**Type of article:** Systematic review

#### **Abstract:**

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### **Abstract**

Coughing is one of the most prevalent symptoms in children presenting at outpatient departments. This systematic review aimed to review previous literature in order to compare the use of honey and antitussive medications for treating coughs in children. Literature was screened across five databases using Medical Subject Heading (MeSH) strategy, keywords, and inclusion and exclusion criteria. The remaining literature was evaluated using a quality appraisal tool checklist. This review includes systematic reviews, meta-analyses, randomized controlled trials (RCTs), observational studies, cross-sectional studies, and articles without a defined methodology section. This review suggests that honey is effective in treating children above 12 months of age, while cold and cough medications (CCMs) are safe if administered at therapeutic doses. Since fatalities can occur in children under two years of age, further RCT studies on CCMs are required to establish safety across all age groups.

#### **Key findings:**

- Honey was effective in reducing nocturnal cough

- Honey improved sleep quality compared to diphenhydramine and OTC cough medications
- OTC cough medications had limited effectiveness and were associated with safety concerns, especially in children < 6 years old
- FDA and AAP discourage OTC cough medications in young children
- Honey is considered safe for children > 1 year old

**Why I chose this article:** I chose this article because it is a systematic review that directly compares honey with over-the-counter cough medications in pediatric patients, which directly answers my PICO question. This study is useful because it not only evaluates intervention effectiveness but also highlights safety concerns associated with OTC medications, including FDA and AAP recommendations against their use in young children. This is relevant to my patient, whose mother is already using OTC cough syrup with minimal improvement. The article demonstrates that honey provides comparable or superior symptom relief while avoiding the risks associated with common antitussive medications. Hence, this strengthens the argument for recommending honey as a safer and more effective alternative in children with viral upper respiratory infections.

## **Article 2**

### **Citation:**

Kuitunen, I., & Renko, M. (2023). *Honey for acute cough in children—A systematic review*. *Journal of Pediatrics*, 182, 3949–3956. <https://doi.org/10.1007/s00431-023-05066-1>

**Type of article:** Systematic review

### **Abstract:**

#### **Abstract**

To analyze the efficacy of using honey to treat acute cough in children. Systematic review, synthesis without meta-analysis. We searched PubMed, Scopus, CENTRAL, CINAHL, and Web of Science databases on August 15, 2022, for words honey and cough. Randomized controlled trials conducted in children were included. Risk-of-bias and evidence quality were assessed. Studies were not pooled due to lack of key information. Instead, we provided the range of observed effects for the main outcomes. Three hundred ninety-six papers were screened, and 10 studies were included. Two studies had high risk-of-bias and six had some concerns. Honey seemed to decrease cough frequency more than placebo/no treatment (range of observed effect 0.0–1.1 points) and cough medication (0.2–0.9 points). Sleep improved more often in the honey group (range of effect was 0.0–1.1) compared to placebo/no treatment and (–0.2–1.1 points) compared to cough medication. Quality of the evidence was low to very low.

*Conclusion:* We found low quality evidence that honey may be more effective than cough medication or placebo/no treatment in relieving symptoms and improving sleep in children with acute cough. Better quality randomized, placebo-controlled blinded trials are needed to confirm the effectiveness of honey in treating acute cough in children.

*Trial registration:* CRD42022369577.

### **Key findings:**

- Honey reduced cough frequency in comparison with placebo group
- Honey reduced cough severity in comparison with OTC medication group
- Honey improved sleep quality in children and parents
- Adverse reaction of honey use was minimal (0-14%, mostly mild GI symptoms)

- Overall quality of evidence was low, but consistency of findings across multiple studies strengthens honey use in clinical settings

**Why I chose this article:** I chose this article because it is a systematic review specifically focuses on pediatric patients with acute cough, which closely matches my PICO question and patient scenario. This systematic review evaluates randomized controlled trials comparing honey to placebo and over-the-counter medications, making it highly relevant for determining effectiveness. The study highlights that honey improves both cough symptoms and sleep quality, which is particularly important in my patient who has worsening nighttime cough affecting sleep. It also addresses safety, showing minimal adverse effects, which supports honey as a safer alternative to OTC medications that may have potential risks in children. Even though the quality of evidence is considered low, the consistency of findings across multiple studies strengthens its clinical applicability.

### Article 3

#### Citation:

Ouaamr, M. A., Mekkaoui, M., Kamel, N., Hassar, M., Cherrah, Y., & Alaoui, K. (2025). *The therapeutic effect of honey on respiratory infections: A systematic review*. Medical Journal, 59(1), 20–39. <https://doi.org/10.35516/jmj.v59i1.988>

**Type of article:** Systematic review with meta-analysis

#### Abstract:

##### Abstract

**Background:** In the context of complementary medicine, honey is a product used alongside conventional medical treatments or therapies to enhance their effectiveness or provide additional benefits. Honey has been used for centuries in traditional and complementary medicine for its various health-promoting properties.

**Objectives:** The aim of this systematic review was to analyze studies on the therapeutic use of honey in acute respiratory infections (ARI) and exacerbations of chronic diseases (ECD), and to compare the effect of honey with other traditional treatments/remedies.

**Methods:** literature searches on PubMed, Medline, Scopus, ScopeMed, and Google Scholar were performed to discover the current state of knowledge on the subject and recent publications. Variables were analysed using the full meta-analysis software, version 3 (Biostat, NJ, USA). Variables were analysed to calculate the odds ratio (OR) and standardised mean difference for dichotomous and continuous variables, respectively. Corresponding 95% confidence intervals for effect sizes were also calculated using a fixed-effects model. Mantel-Haenszelen random-effects models were used due to the large number of articles and the presence of significant heterogeneity. Heterogeneity was considered significant with an  $I^2$  value greater than 50% or a P value less than 0.01.

**Results:** We found that honey seems to improve symptoms in both children and adults. Studies used from the literature search comprised 43% of pediatric studies; 26% were in an ambulatory setting; 9% were in surgical and 22% were medical. The results showed that honey was associated with a significantly greater reduction in the combined cough symptom score, frequency, and severity of acute infections, and an improvement in forced vital capacity, forced expiratory volume, peak expiratory flow, and respiratory symptoms for exacerbations of chronic diseases. Most of the studies reviewed were less than 10 years old; the comparison of the risk of bias between the studies showed that 48% of the studies on ARI (acute respiratory infections) had a low risk of bias, while this percentage was higher for the studies on exacerbations of chronic diseases (ECD) (68%).

**Conclusion:** Honey probably improves symptoms of respiratory infections, so it is recommended that honey may be a supplement to usual medicines and treatments.

**Key findings:**

- Honey significantly improved cough frequency and severity. Overall, respiratory symptom scores were also improved
- Improved lung functions measure such as FEV and peak flow
- 43% of studies were pediatric populations in which honey was seen to perform better than standard treatments or OTC medications
- No significant safety concerns reported

**Why I chose this article:** I chose this article because it is a systematic review and meta-analysis, which represents a high level of evidence and it reinforces the findings from Article 2, which suggest that although the overall quality of evidence is low, honey may still be more effective than over-the-counter cough medications in improving symptoms. This article strengthens that conclusion by demonstrating consistent improvement in cough frequency, severity, and overall respiratory symptoms across multiple studies. In addition, it highlights that honey can be used as a complementary therapy alongside standard treatments. This is particularly relevant to my PICO because it not only supports the potential effectiveness of honey, but also emphasizes its safety and role as a supportive option for symptom relief in children. Even though high-quality evidence is limited, this article helps show that honey is a reasonable and safe alternative or adjunct to traditional cough medications in pediatric patients.

**Clinical bottom line:**

Overall, the evidence from these systematic reviews suggests that honey is a safe and effective option for symptomatic relief of cough in children with viral upper respiratory infections. Across multiple studies, honey consistently demonstrates improvement in cough frequency, severity, and sleep quality, often showing comparable or superior outcomes when compared to over-the-counter cough medications. In contrast, OTC medications have limited proven benefit and are associated with potential safety concerns, particularly in younger children, with recommendations from organizations such as the Food and Drug Administration and American Academy of Pediatrics discouraging their use in this population. Although the overall quality of evidence is considered low, the consistency of findings across studies supports the clinical use of honey as a reasonable first-line or adjunctive treatment. Therefore, in a patient like this 5-year-old with a viral URI and persistent nocturnal cough, honey can be recommended as a safe and effective alternative to OTC cough medications to improve symptoms and sleep quality. However, it is not recommended for children < 1 year to consume honey due to risk of botulism.